NOEL H. HOLMGREN

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AN

ILLUSTRATED FLORA

OF THE

NORTHERN UNITED STATES, CANADA

AND THE

BRITISH POSSESSIONS

FROM NEWFOUNDLAND TO THE PARALLEL OF THE SOUTHERN BOUNDARY OF VIRGINIA, AND FROM THE ATLANTIC OCEAN WESTWARD TO THE 102D MERIDIAN

BY

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THE DESCRIPTIVE TEXT

CHIEFLY PREPARED BY PROFESSOR BRITTON, WITH THE ASSISTANCE OF SPECIALISTS IN SEVERAL GROUPS; THE FIGURES ALSO DRAWN UNDER HIS SUPERVISION

IN THREE VOLUMES

VOL. III

APOCYNACEAE TO COMPOSITAE

DOGBANE TO THISTLE

NEW YORK
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1898

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SYMBOLS USED.

° is used after figures to indicate feet.

′ is used after figures to indicate inches.

″ is used after figures to indicate lines, or twelfths of an inch.

ˊ over syllables indicates the accent, and the *short* English sound of the vowel.

ˋ over syllables indicates the accent, and the long, broad, open or close English sound of the vowel.

In the Metric System

The metre = 39.37 inches, or 3 feet 3.37 inches.
The decimetre = 3.94 inches.
The centimetre = $\frac{2}{5}$ of an inch, or $4\frac{3}{4}$ lines.
The millimetre = $\frac{1}{25}$ of an inch, or $\frac{1}{2}$ a line.
$2\frac{1}{2}$ millimetres = 1 line.

} very nearly.

Preface to Volume III.

With the publication of the concluding volume of the Illustrated Flora, the authors desire to express their appreciation of the favor with which the previous volumes have been received. Volume III, it is believed, will be found no less useful than the preceding ones; and from the difficulties presented to the student by the great family of Composites, which occupies about one-half of the present volume, this may prove to be the most helpful of all.

The number of species figured in the whole work is 4162, comprising 177 Families and 1103 Genera. Eighty-one of these species, mostly western, being new determinations or new discoveries, made while the work has been going through the press and too late for insertion in their proper places, are figured in the Appendix (pp. 484 to 521). These bring up to January, 1898, it is believed, all well established species within our area. The cuts are numbered consecutively throughout the work, except those in the Appendix, which are referred to their proper places by giving to each the number of the previously figured species to which it is most closely allied, with the addition of the letter a, b or c, etc., for distinction.

As respects the admission of new species, the aim has been to pursue a conservative course, and to admit those only that upon continuous observation appear to bear the requisite tests of constancy and persistency in their distinguishing characters. In an illustrated work, however, devoted to the reproduction of what is found in nature, it is better to err in illustrating too many forms, rather than in giving too few.

A general Key of the Orders and Families, prepared by Dr. Britton according to the method followed in the Keys to the genera and species, will be found at the beginning of the volume, preceded by a table of abbreviations of the names of botanical authors cited. At the close is a glossary of the special botanical terms here used, followed by a complete General Index of all the Latin names, including synonyms, used throughout the work.

This general Key has been elaborated on the natural method, dividing the two subkingdoms of plants described in the work into Classes, Sub-classes, Orders and Families successively. The Orders are not described in the work itself, but their principal distinguishing characters are given in this key. The natural method adopted necessitates a considerable number of exceptions to statements, owing to the varying degree of development of floral organs in the derivation of plants from their ancestors; these exceptions are either noted under the headings or indicated by cross-references.

In using this key, or any of the keys to genera or to species, the student will often find, in the analysis of a plant that it does not provide all the information necessary for its determination; this is generally owing to the incomplete condition of the specimen collected; it may be in flower, while the characteristic differences between it and others are only to be found in the fruit, or *vice versa*; or the species may be dioecious, or polygamous, when its other organs, perchance the characteristic ones, must be sought on another individual, and there are various other causes for incompleteness. It is therefore earnestly recommended that collections be carefully made, seeking to reduce as far as possible this more or less necessary incompleteness. Where satisfactory material can not be obtained, it will usually be found possible to reach the desired analysis by following out two or more lines of the key, and by comparing the results reached with the descriptions to determine the family, genus or species. The illustrations provide an almost indispensable aid in such cases.

For the general English Index at the end of this volume, Judge Brown has compiled a list of all the popular names of the plants belonging to our area, so far as obtainable, both general and local, including also most of the English names of our plants that have been heretofore used by botanical authors, as well as most of the older and the more modern English popular names of plants common to our area and to England. Hundreds of these latter names were brought to this country by the early English colonists, some of which are still current here that are now disused there.

A considerable number of the popular names are given in the text in connection with the leading English name, or in the notes. Several thousand others, which could not appear in the text, are printed in the Index in *italics*. These are referred to the proper plant by the number of the illustration or figure (f). The list includes in all about 10,000 different plant-names, and upwards of 12,000 references to the illustrations. It embraces all our plant-

names commonly used by pharmacists, druggists, horticulturists and plant-collectors, or likely to be met with in botanical or current literature.*

No similar compilation of American plant-names has been hitherto published. Many of them are not to be found in any general dictionaries. To the mass of the people, this Index, in connection with the references to the illustrations, will afford the readiest means of plant-identification, and to them it is practically indispensable for that purpose.

These names are full of interest, from their origin, history and significance. As observed in Britten and Holland's work cited in the notes below, "they are derived from a variety of languages, often carrying us back to the early days of our country's history, and to the various peoples who as conquerors or colonists have landed on our shores and left an impress on our language. Many of these old world words are full of poetical association, speaking to us of the thoughts and feelings of the old world people who invented them; others tell of the ancient mythology of our ancestors, of strange old medicinal usages, and of superstitions now almost forgotten."

Most of these names suggest their own explanation. The greater number are either descriptive or derived from the supposed uses, qualities or properties of the plants; many refer to their habitat, appearance or resemblance real or fancied to other things; others come from poetical suggestion, affection or association with saints or persons. Many are very graphic, as the western name, *Prairie Fire* (Castilleia coccinea); many are quaint or humorous, as *Clingrascat* (Galium Aparine) or *Wait-a-bit* (Smilax rotundifolia); and in some the corruptions are amusing, as *Aunt Jerichos* (N. Eng.) from Angelica. The words *Horse*, *Ox*, *Dog*, *Butt*, *Snake*, *Toad* are often used as a prefix to denote size, coarseness, worthlessness or aversion. *Devil* or *Devil's* is used as a prefix for upwards of 40 of our plants, mostly expressive of dislike or of some traditional resemblance or association. A number of names have been contributed by the Indians, such as Chinquapin, Wicopy, Pipsissewa, Wankapin, etc.; while the term Indian, evidently a favorite, is applied as a descriptive prefix to upwards of 80 different plants.

There should be no antagonism in the use of scientific and popular names, since their purposes are quite different. Science demands certainty and universality, and hence a single universal name for each plant. For this the Latin has been adopted, and the Latin name should be used, when only scientific objects are sought. But the vernacular names are a part of the growth and development of the language of each people. Though these names are sometimes indicative of specific characters and hence scientifically valuable, they are for the most part not at all scientific, but utilitarian, emotional or picturesque. As such, they are invaluable; not for science, but for the common intelligence, and the appreciation and enjoyment of the plant world. These names, in truth, reflect the mental attitude of each people, throughout its history, toward the plant kingdom; and the thoughts, suggestions, affections or emotions which it has aroused in them. If these are rich and multitudinous, as in the Anglo-Saxon race, so will the plant-names be also.

Usually the most common or the favorite plants have a variety of names; but this is noticeably otherwise with the Asters and the Golden-rods, of which there are about 120 species within our area, the common names of which, considering their abundance and variety, are comparatively few. The Golden-rods, without distinction, are also known as *Yellow-weed* or *Yellow-tops;* the Asters are called also *Frost-weed*, *Frost-flowers*, *Good-bye Summer* and by the Onandaga Indians, "It brings the Frost." A few like *Aster ericoides* have several interesting names, but most of the species in each genus resemble each other so much that not a quarter of the species have suggested to the popular apprehension any distinctive name; while other less showy plants, like the Pansy (*Viola tricolor*), the Marsh Marigold (*Caltha palustris*), the Spotted Touch-me-not (*Impatiens biflora*), Bluets (*Houstonia coerulea*) and others, have a score of different names.

The Index shows the extent to which the same popular name has been applied to different plants, which is the only cause of confusion; and this confusion will usually be removed by the use of the Index with a reference to the illustrations.

NEW YORK, June 20, 1898.

* In compiling this list, reference has been made to numerous general and special botanical works, to our state and local Floras, to Hobbs' Botanical Handbook (pharmaceutical), to Beal's, Scribner's and Pammel's works on Grasses, to Sudworth's Arborescent Flora, to Britten and Holland's Dictionary of English Plant Names (London, 1886), and to the valuable papers of Mrs. F. D. Bergen on Popular Plant Names in the Botanical Gazette for 1892, p. 365; for 1893, p. 420; for 1894, p. 429, and for 1896, p. 473. Prof. E. S. Burgess has also supplied about 100 popular names not before noted that are in use at Martha's Vineyard and in Washington, D. C.; and Mrs. Horner, of Georgetown, Mass., and Miss Bartlett, of Haverhill, Mass., have each contributed some.

Abbreviations of the Names of Authors.

A. Benn. Bennett, Arthur.
A. Br. Braun, Alexander.
Adans. Adanson, Michel.
Ait. Aiton, William.
Ait. f. Aiton, William Townsend.
All. Allioni, Carlo.
Anders. Andersson, Nils Johan.
Andr. Andrews, Henry C.
Andrz. Andrzejowski, Anton Lukianowicz.
Angs. Angström, Johan.
Ard. Arduino, Luigi.
Arn. Arnott, George Arnold Walker.
Aschers. Ascherson, Paul Friedrich August.
Aubl. Aublet, Jean Baptiste Christophore Fusée.
Aust. Austin, Coe Finch.
Bab. Babington, Charles Cardale.
Bald. Baldwin, William.
Baill. Baillon, Henri.
Bartl. Bartling, Friedrich Gottlieb.
Bart. Barton, William P. C.
Bartr. Bartram, John.
Beauv. Palisot de Beauvois, A.M.F.J.
Benth. Bentham, George.
Benth. & Hook. Bentham, George, and Hooker, Joseph Dalton.
Berch. Berchtold, Friedrich von.
Bernh. Bernhardi, Johann Jacob.
Bess. Besser, Wilhelm S. J. G. von.
Bieb. Bieberstein, F. A. M. von.
Bigel. Bigelow, Jacob.
Bisch. Bischoff, Gottlieb Wilhelm.
Biv. Bivona-Bernardi, Antonio.
Boeckl. Boeckeler, Otto.
Boehm. Boehmer, Georg Rudolf.
Boiss. Boissier, Edmond.
Borck. Borckhausen, Moritz Balthazar.
Brack. Brackinridge, William D.
Brew. Brewer, William Henry.
B. S. P. Britton, N. L.; Sterns, Emerson Alexander; Poggenburg, Justus.
Brot. Brotero, Felix de Avellar.
Buch. Buchenau, Franz.
Buckl. Buckley, Samuel Botsford.
Burgsd. Burgsdorff, Friedrich August Ludwig von.
Carr. Carriere, Élie Abel.
Casp. Caspary, Robert.
Cass. Cassini, Henri.
Cav. Cavanilles, Antonio José.
Celak. Celakowsky, Ladislav.
Cerv. Cervantes, Vicente.
Cham. Chamisso, Adalbert von.
C. & S., Cham. & Sch. Chamisso and Schlechtendahl.
Chapm. Chapman, Alvan Wentworth.
Chois. Choisy, Jacques Denis.
Clairv. Clairville, Joseph Philippe de.
Clayt. Clayton, John.
Cogn. Cogniaux, Alfred.
Coult. (Dips.) Coulter, Thomas.
Coult. Coulter, John Merle.
C. & R. Coulter, J. M. and Rose, Joseph Nelson.
Darl. Darlington, William.
Davenp. Davenport, George Edward.
DC. De Candolle, Augustin Pyramus.
A. DC. De Candolle, Alphonse.
Dec. Decaisne, Joseph.
Desf. Desfontaine, René Louiche.
Desr. Desroussoux.
Desv. Desvaux, Nicaise Augustin.
Dicks. Dickson, James.
Dietr. Dietrich, David Nathanael Friedrich.
Dill. Dillen, John Jacob.
Dougl. Douglas, David.
Drej. Drejer, Saloman Thomas Nicolai.
Dryand. Dryander, Jonas.
Dufr. Dufresne, Pierre.
Dumort. Dumortier, Barthélemy Charles.
Eat. Eaton, Amos.
Eat. & Wr. Eaton, Amos, and Wright, John.
Eberm. Ebermaier, Karl Heinrich.
Ehrh. Ehrhart, Friedrich.
Ell. Elliott, Stephen.
Endl. Endlicher, Stephen Ladislaus.
Engelm. Engelmann, George.
Esch. Escholtz, Johann Friedrich.
Fabr. Fabricius, Philipp Konrad.
Fisch. Fischer, Friedrich Ernst Ludwig von.
F. & M. Fischer and Meyer, C. A.
Foug. Fougeroux, Auguste Denis.
Forsk. Forskal, Pehr.
Forst. Forster, Johann Reinhold, and George.
Fresen. Fresenius, Johann Baptist Georg Wolfgang.
Froel. Froelich, Joseph Aloys.
Gaert. Gaertner, Joseph.
Gaertn. f. Gaertner, Carl Friedrich.
Gal. Galeotti, Henri.
Gaud. Gaudichaud-Beaupré, Charles.
Gey. Geyer, Carl Andreas.
Gill. Gillies, John.
Ging. Gingins de Lassaraz, Frédéric Charles Jean.
Glox. Gloxin, Benjamin Peter.
Gmel. Gmelin, Samuel Gottlieb.
Gmel. J. F. Gmelin, Johann Friedrich.
Gooden. Goodenough, Samuel.
Gren. & Godr. Grenier, Charles, and Godron, D. A.
Grev. Greville, Robert Kaye.
Griseb. Grisebach, Heinrich Rudolf August.
Gronov. Gronovius, Jan Frederik.
Guss. Gussone, Giovanni.
Hack. Hackel, Eduard.
Hall. Haller, Albert von.
Hamilt. Hamilton, William.
Hartm. Hartman, Carl Johann.
Hassk. Hasskarl, Justus Carl.
Hausskn. Haussknecht, Carl.
Haw. Haworth, Adrian Hardy.
HBK. Humboldt, Friedrich Alexander von; Bonpland, Aimé and Kunth, Carl Siegesmund.
Hegelm. Hegelmaier, Friedrich.
Hell. Hellenius, Carl Niclas.
Heist. Heister, Lorenz.
Herb. Herbert, William.
Hitch. Hitchcock, Albert Spear.
Hochst. Hochstetter, Christian Friedrich.
Hoffm. Hoffman, Georg Franz.
Hoffmg. Hoffmansegg, Johann Centurius.
Holl. Hollick, Arthur.
Hook. Hooker, William Jackson.
H. & A. Hooker, W. J., and Arnott, George A. Walker.
Hook. f. Hooker, Joseph Dalton.
Hornem. Hornemann, Jens Wilken.
Huds. Hudson, William.
Irm. Irmisch, Thilo.
Jacq. Jacquin, Nicolas Joseph.
Juss. Jussieu, Antoine Laurent.
A. Juss. Jussieu, Adrien de.
Karst. Karsten, H.
Kl. Klotsch, Johann Friedrich.
Kuehl. Kühlwein.
L. Linnaeus, Carolus, or Carl von Linné.
L. f. Linné, Carl von (the son).

L'Her. L'Heritier de Brutelle, Charles Louis.
Laesl. Laestadius, Lars Levi.
Lag. Lagasca, Mariano.
Lam. Lamarck, Jean Baptiste Antoine Pierre Monnet.
Lamb. Lambert, Aylmer Bourke.
Leavenw. Leavenworth, Melines C.
Ledeb. Ledebour, Carl Friedrich von.
Lehm. Lehmann, Johann Georg Christian.
Le Peyr. Le Peyrouse, Philippe.
Lepech. Lepechin, Iwan.
Lesp. & Thev. Lespinasse, G., and Theveneau, A.
Less. Lessing, Christian Friedrich.
Lestib. Lestiboudois. François Joseph.
Lightf. Lightfoot, John.
Lilj. Liljeblad, Samuel.
Lindl. Lindley, John.
Lodd. Loddiges, Conrad.
Loefl. Loefling, Pehr.
Lois. Loiseleur-Deslongchamps, Jean Louis Auguste.
Loud. Loudon, John Claudius.
Lour. Loureiro, Juan.
MacM. MacMillan, Conway.
Marsh. Marshall, Humphrey.
Mars. Marsson, Theodor.
Mart. Martens, Martin.
Mart. & Gal. Martens, Martin, and Galeotti, Henri.
Maxim. Maximowicz, Carl Johann.
Med. Medicus, Friedrich Cassimir.
Meisn. Meisner, Carl Friedrich.
Mer. Merat, François Victor.
Mert. & Koch M. & K. Mertens, Franz Karl, and Koch, Wilhelm Daniel Joseph.
Mett. Mettenius, George Heinrich.
Mey. Meyer, Ernst Heinrich Friedrich.
Michx. Michaux, André.
Michx. f. Michaux, François André.
Mill. Miller, Philip.
Millsp. Millspaugh, Charles Frederic.
Mitch. Mitchell, John.
Mont. Montagne, Jean François Camille.
Moric. Moricand, Moise Etienne.
Moq. Moquin-Tandon, Alfred.
Muell. Arg. Müller, Jean, of Aargau.
Muench. Muenchhausen, Otto von.
Muhl. Mühlenberg, Heinrich Ludwig.
Murr. Murray, Johann Andreas.
Neck. Necker, Noel Joseph de.
Nestl. Nestler, Christian Gottfried.
Nutt. Nuttall, Thomas.
Ort. Ortega, Casimiro Gomez.
Pall. Pallas, Peter Simon.
Parl. Parlatore, Filippo.
P. Br. Browne, Patrick.
Pers. Persoon, Christian Hendrik.
Planch. Planchon, Jules Emile.
Poir. Poiret, Jean Louis Marie.
Poll. Pollich, Johann Adam.
Pourr. Pourret, Pierre André.
R. Br. Brown, Robert.
Raf. Rafinesque-Schmaltz, Constantino Samuel.
Redf. & Rand. Redfield, John H., and Rand, Edward S.
Reichenb. Reichenbach, Heinrich Gottlieb Ludwig.
Retz. Retzius, Anders Johan.
Richards. Richardson, John.
Roem. Roemer, Johann Jacob.
R. & S. Roemer, J. J., and Schultes, Joseph August.
Roem. & Ust. Roemer, J. J., and Usteri, Paulus.
Rostk. Rostkovius, Friedrich Wilhelm Gottlieb.
Rottb. Rottboell, Christen Fries.
Roxb. Roxburgh, William.
R. & P. Ruiz, Lopez Hipolito, and Pavon, Josef.
Rupr. Ruprecht, Franz J.
Rydb. Rydberg, Per Axel.
St. Hil. St. Hilaire, August de.
Salisb. Salisbury, Richard Anthony.
Sarg. Sargent, Charles Sprague.
Sartw. Sartwell, Henry P.
Sav. Savi, Gaetano.
Schk. Schkuhr, Christian.
Schlecht. Schlechtendal, Diedrich Franz Leonhard von.
Schleich. Schleicher, J. C.
Schleid. Schleiden, Matthias Jacob.
Schrad. Schrader, Heinrich Adolph.
Schreb. Schreber, Johann Christian Daniel von.
Schult. Schultes, Joseph August.
Sch. Bip. Schultz Bipontinus, Karl Heinrich.
Schum. Schumacher, Christian Friedrich.
Schwein. Schweinitz, Lewis David von.
Scop. Scopoli, Johann Anton.
Scribn. Scribner, Frank Lamson.
Scribn. & Ryd. Scribner, F. L., and Rydberg, P. A.
Ser. Seringe, Nicolas Charles.
Seub. Seubert, Moritz.
Sheld. Sheldon, Edmund P.
Shuttlw. Shuttleworth, Robert.
Sibth. Sibthorp, John.
Sieb. & Zucc. Siebold, Philipp Franz von, and Zuccarini, Joseph Gerhard.
Soland. Solander, Daniel.
Spreng. Sprengel, Kurt.
Steud. Steudel, Ernest Gottlieb.
Stev. Steven, Christian.
Sudw. Sudworth, George B.
Sw. Swartz, Olof.
S. Wats. Watson, Sereno.
Thuill. Thuillier, Jean Louis.
Thunb. Thunberg, Carl Peter.
Thurb. Thurber, George.
Torr. Torrey, John.
Torr. & Schw. Torrey, J., and Schweinitz, L. D.
Torr. & Hook. Torrey, John, and Hooker, William Jackson.
Tourn. Tournefort, Joseph Pitton de.
Tratt. Trattinnick, Leopold.
Trel. Trelease, William.
Traut. Trautvetter, Ernest Rudolph.
Trin. Trinius, Karl Bernhard.
Trin. & Rupr. Trinius, Karl, and Ruprecht, F. J.
Tuckerm. Tuckerman, Edward.
Turcz. Turczaninow, Nicolaus.
Underw. Underwood, Lucien Marcus.
Vaill. Vaillant, Sébastien.
Vell. Velloso, José Marianno de Conceiçao.
Vent. Ventenat, Étienne Pierre.
Vill. Villars, Dominique.
Wahl. Wahlenberg, Georg.
Wahlb. Wahlenberg, Pehr Friedrich.
W. & K. Waldstein, Franz Adam von, and Kitalbal, Paul.
Wallr. Wallroth, Karl Friedrich Wilhelm.
Walp. Walpers, Wilhelm Gerhard.
Walt. Walter, Thomas.
Wang. Wangenheim, Friedrich Adam Julius von.
Wats. & Coult. Watson, Sereno, and Coulter, John Merle.
Web. Weber, Friedrich.
Wedd. Weddell, H. A.
Weinm. Weinmann.
Wender. Wenderoth, George Wilhelm Franz.
Wettst. Wettstein, R. von.
Wigg. Wiggers, Friedrich Heinrich.
Willd. Willdenow, Carl Ludwig.
Wimm. Wimmer, Friedrich.
Wisliz. Wislizenus, A.
With. Withering, William.
Wolfg. Wolfgang.
Woodv. Woodville, William.
Wormsk. Wormskiold, M. von.
Wr. Wright, John.
Wulf. Wulfen, Franz Xavier.

General Key to the Orders and Families.

Subkingdom PTERIDOPHYTA. 1: 1–48.

SPORES DEVELOPING INTO FLAT OR IRREGULAR PROTHALLIA, WHICH BEAR THE REPRODUCTIVE ORGANS (ANTHERIDIA AND ARCHEGONIA); FLOWERS AND SEEDS NONE.

1. Spores produced in sporanges, which are borne on the back of a leaf, in spikes or panicles, or in special conceptacles. Order 1. FILICALES.

*** Spores all of one sort and size (isosporous families).**

† Vernation erect or inclined; sporanges in spikes, or panicles, opening by a transverse slit.
Fam. 1. *Ophioglossaceae.* 1: 1.

† † Vernation coiled; sporanges reticulated, usually provided with a ring (annulus).

Sporanges opening vertically.
Sporanges panicled, with a rudimentary ring; marsh ferns. Fam. 2. *Osmundaceae.* 1: 4.
Sporanges sessile on a filiform receptacle; leaves filmy, translucent.
Fam. 3. *Hymenophyllaceae.* 1: 6.
Sporanges ovoid, in panicles, or spikes, provided with an apical ring.
Fam. 4. *Schizaeaceae.* 1: 7.

Sporanges opening transversely, provided with a vertical ring; borne in sori on the back or margin of a leaf. Fam. 5. *Polypodiaceae.* 1: 8.

*** * Spores of two sizes (microspores and macrospores).**

Plants rooting in the mud; leaves 4 foliolate, or filiform. Fam. 6. *Marsileaceae.* 1: 33.
Plants floating; leaves entire, or 2-lobed. Fam. 7. *Salviniaceae.* 1: 34.

2. Spores produced in sporanges, which are clustered underneath the scales of a terminal cone-like spike; stems jointed, rush-like. Order 2. EQUISETALES.
One family. Fam. 8. *Equisetaceae.* 1: 35.

3. Spores produced in sporanges, which are borne in the axils of scale-like or tubular leaves. Order 3. LYCOPODIALES.

Spores all of one sort and size. Fam. 9. *Lycopodiaceae.* 1: 39.
Spores of two sizes (microspores and macrospores).
Leaves scale-like, 4–many-ranked, on branching stems. Fam. 10. *Selaginellaceae.* 1: 44.
Leaves tubular, clustered on a corm-like trunk; aquatic or mud plants.
Fam. 11. *Isoetaceae.* 1: 45.

Subkingdom SPERMATOPHYTA. 1: 49.

MICROSPORES (POLLEN-GRAINS) DEVELOPING INTO A TUBULAR PROTHALLIUM (POLLEN-TUBE); MACROSPORES (EMBRYO-SAC) DEVELOPING A MINUTE PROTHALLIUM, AND, TOGETHER WITH IT, REMAINING ENCLOSED IN THE MACROSPORANGE (OVULE) WHICH RIPENS INTO A SEED.

Class 1. GYMNOSPERMAE. Ovules not enclosed in an ovary. 1: 49–61.

Fruit a cone, with several or numerous scales, sometimes berry-like by their cohesion.
Fam. 1. *Pinaceae.* 1: 49.
Fruit (in our genus) a fleshy integument nearly enclosing the seed. Fam. 2. *Taxaceae.* 1: 61.

Class 2. ANGIOSPERMAE. Ovules enclosed in an ovary. 1: 61.

Subclass 1. MONOCOTYLEDONES. 1: 62–481.

EMBRYO WITH 1 COTYLEDON; STEM WITH NO DISTINCTION INTO PITH, WOOD AND BARK; LEAVES MOSTLY PARALLEL-VEINED.

1. Carpels 1, or more, distinct (united, at least partially, in Family 4, Scheuchzeriaceae, where they are mostly united until maturity, and Family 6, Vallisneriaceae, aquatic herbs, with monoecious or dioecious flowers); parts of the flowers mostly unequal in number.

*** Inflorescence various, not a true spadix.**

† Flowers not in the axils of dry chaffy scales (glumes); our species aquatic or marsh plants.

‡ Endosperm mealy or fleshy; perianth of bristles or chaffy scales; flowers monoecious, spicate or capitate. Order 1. PANDANALES.
Flowers spicate, terminal. Fam. 1. *Typhaceae.* 1: 62.
Flowers capitate, the heads axillary to leaf-like bracts. Fam. 2. *Sparganiaceae.* 1: 63.

‡ ‡ Endosperm none, or very little; perianth corolla-like, or herbaceous, or none.
Order 2. NAIADALES (*Fluviales*).

Perianth, if present, inferior; carpels mostly distinct.
Perianth-segments, when present, herbaceous.
Carpels distinct; aquatic herbs. Fam. 3. *Naiadaceae.* 1: 65.
Carpels united until maturity; bog plants; flowers racemed or spiked.
Fam. 4. *Scheuchzeriaceae.* 1: 82.
Perianth of 2 series of segments, the outer (sepals) green, the inner (petals) mostly white.
Fam. 5. *Alismaceae.* 1: 84.
Perianth superior; carpels united. Fam. 6. *Vallisneriaceae.* 1: 92.

† † Flowers in the axils of dry chaffy scales (glumes), arranged in spikes or spikelets. Order 3. GRAMINALES (*Glumiflorae*).

Fruit a caryopsis (grain); stems (culms) mostly hollow in our species. Fam. 7. *Gramineae.* 1: 94.
Fruit an achene; stems (culms) solid. Fam. 8. *Cyperaceae.* 1: 234.

(Order 4, PRINCIPES, including only the family *Palmaceae*, Palms and Order 5, SYNANTHAE, including only the family *Cyclanthaceae*, are not represented in our territory.)

* * Inflorescence a fleshy spadix, with or without a spathe; or plants minute, floating free, the flowers few or solitary on the margin or back of the thallus. Order 6. ARALES (*Spathiflorae*).

Large herbs, with normal foliage and well-developed spadix. Fam. 9. *Araceae.* 1: 360.
Minute floating thalloid plants. Fam. 10. *Lemnaceae.* 1: 365.

2. Carpels united into a compound ovary; parts of the usually complete flowers mostly in 3's or 6's.

* Seeds with endosperm.

† Flowers regular, or nearly so (corolla irregular in *Commelina*).

‡ Endosperm mealy; ovary superior. Order 7. XYRIDALES (*Farinosae*).

a. Ovary 1-celled.

Aquatic moss-like leafy herbs; flowers solitary. Fam. 11. *Mayacaceae.* 1: 367.
Erect rush-like herbs; flowers in terminal scaly heads or spikes. Fam. 12. *Xyridaceae.* 1: 368.
Mud or aquatic herbs, the flowers subtended by spathes (*Heteranthera* in Pontederiaceae 1: 379).

b. Ovary 2–3-celled (except in some Pontederiaceae).

Flowers very small, densely capitate, monoecious or dioecious. Fam. 13. *Eriocaulaceae.* 1: 371.
Flowers perfect.
Epiphytes; leaves scurfy. Fam. 14. *Bromeliaceae.* 1: 374.
Terrestrial or aquatic herbs; leaves not scurfy.
Perianth of 2 series of parts, the outer (sepals) green, the inner (petals) colored. Fam. 15. *Commelinaceae.* 1: 374.
Perianth 6-parted. Fam. 16. *Pontederiaceae.* 1: 379.

‡ ‡ Endosperm fleshy or horny; ovary superior or inferior. Order 8. LILIALES.

a. Ovary superior (except in *Aletris*, in the Liliaceae, and some species of *Zygadenus* in the Melanthaceae).

Perianth-segments distinct, green or brown, not petal-like; herbs with grass-like leaves and small flowers. Fam. 17. *Juncaceae.* 1: 381.
Perianth-segments distinct, or partly united, at least the inner petal-like.
Fruit a capsule (except in *Yucca baccata*, where it is large, fleshy and indehiscent).
Capsule mostly septicidal; plants rarely bulbous. Fam. 18. *Melanthaceae.* 1: 399.
Capsule loculicidal (septicidal in *Calochortus*); plants mostly bulbous. Fam. 19. *Liliaceae.* 1: 410.
Fruit a fleshy berry.
Erect herbs; tendrils none; flowers perfect. Fam. 20. *Convallariaceae.* 1: 427.
Vines, climbing by tendrils, or rarely erect; flowers dioecious, in axillary umbels. Fam. 21. *Smilaceae.* 1: 438.

b. Ovary inferior, wholly or in part.

Stamens 3, opposite the inner corolla-segments. Fam. 22. *Haemodoraceae.* 1: 442.
Stamens 6 in our species.
Erect perennial herbs; flowers perfect. Fam. 23. *Amaryllidaceae.* 1: 443.
Twining vines; flowers dioecious. Fam. 24. *Dioscoreaceae.* 1: 446.
Stamens 3, opposite the outer corolla-segments. Fam. 25. *Iridaceae.* 1: 447.

† † Flowers very irregular; ovary inferior. Order 9. SCITAMINALES.

One family represented in our territory. Fam. 26. *Marantaceae.* 1: 454.

* * Seeds without endosperm, very numerous and minute; ovary inferior. Order 10. ORCHIDALES (*Microspermae*).

Flowers regular; stem-leaves reduced to scales. Fam. 27. *Burmanniaceae.* 1: 455.
Flowers very irregular. Fam. 28. *Orchidaceae.* 1: 456.

Subclass 2. DICOTYLEDONES. 1: 482.

EMBRYO NORMALLY WITH 2 COTYLEDONS; STEMS DIFFERENTIATED INTO PITH, WOOD AND BARK; LEAVES MOSTLY NET-VEINED.

Series 1. CHORIPETALAE. 1: 482 to 2: 547.

Petals distinct to the base, or wanting (exceptions noted Vol. 1: 482).

A. Petals none, except in Portulacaceae and in most Caryophyllaceae, which are herbs with leaves nearly always opposite, the seeds with endosperm, and in the pistillate flowers of the walnuts (*Juglans*).

1. Calyx none (except in the Juglandaceae, which are trees with odd-pinnate leaves).

Marsh herbs with perfect flowers in nodding spikes. Order 1. PIPERALES.
One family only. Fam. 1. *Saururaceae.* 1: 482.
Trees or shrubs; staminate flowers, and sometimes also the pistillate, in aments.
Leaves odd-pinnate; fruit a nut enclosed in a husk. Order 2 JUGLANDALES.
One family only. Fam. 2. *Juglandaceae.* 1: 483.
Leaves simple.
Fruit 1-seeded. Order 3. MYRICALES.
Ovule erect, orthotropous. Fam. 3. *Myricaceae.* 1: 487.
Ovule laterally attached, ascending, amphitropous. Fam. 4. *Leitneriaceae.* 1: 489.
Fruit many-seeded; seeds with a tuft of hairs at one end. Order 4. SALICALES.
One family only. Fam. 5. *Salicaceae.* 1: 490.

2. Calyx present.

* Flowers, at least the staminate ones, in aments. Order 5. FAGALES.

Both staminate and pistillate flowers in aments. Fam. 6. *Betulaceae.* 1: 506.
Pistillate flowers subtended by an involucre, which becomes a bur or a cup in fruit.
Fam. 7. *Fagaceae.* 1: 513.

* * Flowers not in aments (in ament-like spikes in *Morus*), but variously clustered, rarely solitary.

a. Flowers monoecious, dioecious or polygamous (sometimes perfect in *Ulmus*); ovary superior, 1-celled. Order 6. URTICALES.

Fruit not an achene: trees, shrubs or herbs; ovule pendulous.
Trees with alternate leaves, the sap not milky. Fam. 8. *Ulmaceae.* 1: 523.
Trees with alternate leaves and milky sap; or opposite-leaved herbs or herbaceous vines.
Fam. 9. *Moraceae.* 1: 527.
Fruit an achene; herbs with small clustered greenish flowers; ovule erect or ascending.
Fam. 10. *Urticaceae.* 1: 530.

(Order 7, PROTEALES, extensively developed in the southern hemisphere, is not represented in our area.)

b. Flowers dioecious, or perfect; ovary inferior, at least in part.

Ovary 1-celled. Order 8. SANTALALES.
Tree-parasites, with opposite leaves or scales; fruit a berry. Fam. 11. *Loranthaceae.* 1: 534.
Root-parasites, or shrubs; leaves alternate in our genera; fruit a drupe, or nut.
Fam. 12. *Santalaceae.* 1: 536.
Ovary several- (usually 6-) celled; flowers perfect. Order 9. ARISTOLOCHIALES.
One family in our area. Fam. 13. *Aristolochiaceae.* 1: 537.

c. Flowers mostly perfect in our genera (dioecious in some species of *Rumex* in Polygonaceae, monoecious or dioecious in some Chenopodiaceae and Amaranthaceae); ovary superior.

† Embryo straight, or nearly so; fruit an achene. Order 10. POLYGONALES.
One family. Fam. 14. *Polygonaceae.* 1: 541.

† † Embryo coiled, curved, or annular; fruit not an achene.
Order 11. CHENOPODIALES (*Centrospermae*).

Fruit a utricle (see also last genera of Caryophyllaceae).
Flowers bractless, or, if bracted, the bracts not scarious; sepals green, or greenish.
Fam. 15. *Chenopodiaceae.* 1: 569.
Flowers bracted, the bracts, and also the sepals mostly scarious.
Fam. 16. *Amaranthaceae.* 1: 586.
Fruit fleshy, enclosing several carpels; a berry. Fam. 17. *Phytolaccaceae.* 1: 593.
Fruit an anthocarp, the persistent base of the corolla-like calyx enclosing a utricle.
Fam. 18. *Nyctaginaceae.* 1: 594.
Fruit a capsule, dehiscent by valves, or teeth (utricular in *Anychia*, *Paronychia* and *Scleranthus* of the Caryophyllaceae).
Capsule 2-several-celled; petals none. Fam. 19. *Aizoaceae.* 1: 597.
Capsule 1-celled; petals mostly present.
Sepals 2. Fam. 20. *Portulacaceae.* 2: 1.
Sepals 5 or 4, distinct or united. Fam. 21. *Caryophyllaceae.* 2: 6.

B. Petals present (wanting in Ceratophyllaceae—aquatic herbs with whorled dissected leaves; in many Ranunculaceae; in *Calycocarpum*—a dioecious vine of the Menispermaceae; in Lauraceae—alternate-leaved aromatic trees and shrubs; in Podostemaceae—aquatic herbs, the simple flowers involucrate; in *Liquidambar*—a tree, with palmately-lobed leaves and capitate flowers of the Hamamelidaceae; in *Sanguisorba*—herbs with pinnate leaves of the Rosaceae; in *Xanthoxylum*—trees with pinnate leaves of the Rutaceae; in Euphorbiaceae; in Callitrichaceae, Empetraceae and Buxaceae; in some of the Aceraceae and Rhamnaceae; in Thymeleaceae, Elaeagnaceae, and in some species of *Ludwigia* in Onagraceae and of *Nyssa* in Cornaceae).

I. *Ovary superior, free from the calyx* (partly or wholly inferior in some Saxifragaceae, in Grossulariaceae, Hamamelidaceae, Pomaceae and Loasaceae).

1. Carpels solitary, or several or distinct (united in some Nymphaeaceae); **stamens mostly hypogynous and more numerous than the sepals; sepals mostly distinct.** Order 12. RANALES.

* Aquatic herbs; floating leaves peltate, or with a basal sinus.

Carpels 3, or more; petals large; floating leaves not dissected. Fam. 22 *Nymphaeaceae.* 2: 41.
Pistil 1; petals none; leaves whorled, all submersed and dissected. Fam. 23. *Ceratophyllaceae.* 2: 46.

* * Land or marsh plants (some Ranunculaceae aquatic).

Stamens numerous; sepals distinct; petals present (except in some Ranunculaceae and in *Calycocarpum* of the Menispermaceae).
Receptacle not hollow; leaves alternate (except in *Clematis*).
Flowers perfect (except in some species of *Clematis* and *Thalictrum*).
Fruit aggregate, cone-like; trees; sepals and petals in 3 series, or more, of 3.
Fam. 24. *Magnoliaceae.* 2: 47.
Fruit not aggregate, the carpels separate, at least when mature.
Anthers not opening by valves; pistils usually more than 1.
Sepals 3; petals 6; shrubs or trees. Fam. 25. *Anonaceae.* 2: 49.
Sepals 3–15; petals (when present) about as many; our species herbs or vines (*Xanthorrhiza* shrubby). Fam. 26. *Ranunculaceae.* 2: 50.
Anthers opening by valves (except in *Podophyllum*); pistil 1
Fam. 27. *Berberidaceae.* 2: 89.
Dioecious climbing vines with simple leaves; fruit drupaceous.
Fam. 28. *Menispermaceae.* 2: 93.
Receptacle hollow, enclosing the numerous pistils and achenes; opposite-leaved shrubs.
Fam 29. *Calycanthaceae.* 2: 94.
Stamens 9 or 12, in 3 or 4 series of 3; anthers opening by valves; aromatic trees or shrubs with no petals, more or less united sepals, and 1 pistil. Fam. 30. *Lauraceae.* 2: 95.

2. Carpels 2 or more, united into a compound ovary; stamens hypogynous; sepals mostly distinct.

* Plants not insectivorous.

Order 13. PAPAVERALES (*Rhoeadales*).

Sepals 2 (very rarely 3 or 4); endosperm fleshy. Fam. 31. *Papaveraceae.* 2: 98.

Sepals or calyx-segments 4–8; endosperm none.

Capsule 2-celled by a longitudinal partition, usually 2-valved, rarely indehiscent; sepals and petals 4. Fam. 32. *Cruciferae.* 2: 108.

Capsule 1-celled, of 2–6 carpels.

Sepals and petals 4, regular, or petals irregular; capsule of 2 carpels, 2-valved. Fam. 33. *Capparidaceae.* 2: 154.

Sepals and petals 4–8, irregular; capsule of 3–6 carpels, 3–6-valved at the top; disk large. Fam. 34. *Resedaceae.* 2: 158.

* * Insectivorous plants, secreting a viscid liquid, with basal leaves and scapose flowers.

Order 14. SARRACENIALES.

Ovary 3–5-celled; leaves hollow. Fam. 35. *Sarraceniaceae.* 2: 159.

Ovary 1-celled; leaves circinate in unfolding, the blade flat. Fam. 36. *Droseraceae.* 2: 160.

3. Carpels solitary, or several and distinct, or sometimes united; stamens mostly perigynous or epigynous; sepals mainly united or confluent with the concave receptacle. Order 15. ROSALES.

* Small aquatic fleshy herbs, with a spathe-like involucre, and a 2-3-celled capsule; perianth none. Fam. 37. *Podostemaceae.* 2: 163.

* * Land or rarely swamp plants without an involucre.

† *Endosperm present, usually copious and fleshy.*

Carpels as many as the calyx-segments; stamens as many or twice as many; more or less fleshy herbs. Fam. 38. *Crassulaceae.* 2: 163.

Carpels fewer than the calyx-segments, mostly 2 (ovary 1-celled in *Parnassia*).

Herbs, or opposite-leaved shrubs. Fam. 39. *Saxifragaceae.* 2: 169.

Alternate-leaved shrubs or trees; styles 2.

Fruit a 1-celled berry. Fam. 40. *Grossulariaceae.* 2: 187.

Fruit a 2-celled woody or hard capsule. Fam. 41. *Hamamelidaceae.* 2: 192.

†† *Endosperm none, or very little* (copious in *Opulaster*, shrub of the Rosaceae).

‡ Trees with broad leaves and small monoecious capitate flowers. Fam. 42. *Platanaceae.* 2: 194.

‡ ‡ Flowers perfect (dioecious in *Aruncus* and in species of *Fragaria* of the Rosaceae; in *Gleditsia* and *Gymnocladus* of the Caesalpiniaceae, and rarely in some Papilionaceae).

a. Flowers regular.

Pistils usually several or numerous (one only in *Cercocarpus* and sometimes in species of *Alchemilla* and *Sanguisorba*).

Carpels distinct, sometimes adnate to the calyx, ripening into follicles or achenes. Fam. 43. *Rosaceae.* 2: 194.

Carpels united, enclosed by the calyx-tube and adnate to it, the fruit a pome. Fam. 44. *Pomaceae.* 2: 232.

Pistil only 1.

Ovary 2-ovuled; fruit a drupe; leaves simple. Fam. 45. *Drupaceae.* 2: 246.

Ovary several-ovuled; fruit a legume; leaves 2-3-pinnate. Fam. 46. *Mimosaceae.* 2: 254.

b. Flowers irregular (nearly or quite regular in *Gleditsia* and *Gymnocladus*, trees of the Caesalpiniaceae).

Fruit a legume; upper petal enclosed by the lateral ones in the bud; leaves compound, mostly stipulate. Fam. 47. *Caesalpiniaceae.* 2: 256.

Fruit spiny, indehiscent; leaves simple, exstipulate. Fam. 48. *Krameriaceae.* 2: 261.

Fruit a legume or loment; upper petal enclosing the lateral ones in the bud; leaves compound (sometimes 1-foliolate), stipulate. Fam. 49. *Papilionaceae.* 2: 262.

4. Carpels united into a compound ovary; sepals mostly distinct.

* Stamens few, rarely more than twice as many as the sepals.

† Stamens as many as the sepals or fewer, and opposite them, or more numerous.

‡ Ovules pendulous, the raphe toward the axis of the ovary. Order 16. GERANIALES.

Stamens more than one; land plants.

Flowers regular, or nearly so; petals present, usually as many as the sepals.

Herbs, the leaves not punctate; flowers perfect.

Leaves not pinnately compound.

Capsule at length splitting into its 5 carpels; leaves lobed or dissected. Fam. 50. *Geraniaceae.* 2: 340.

Capsule 2–5-celled, not splitting into its carpels.

Stamens 2–3 times as many as the petals; leaves 3-foliolate in our species. Fam. 51. *Oxalidaceae.* 2: 344.

Stamens as many as the petals; leaves entire. Fam. 52. *Linaceae.* 2: 348.

Leaves pinnately compound. Fam. 53. *Zygophyllaceae.* 2: 351.

Our species trees or shrubs with compound leaves, often punctate; flowers dioecious or polygamous.

Leaves punctate. Fam. 54. *Rutaceae.* 2: 352.

Leaves not punctate, but the bitter bark with oil-sacs. Fam. 55. *Simarubaceae.* 2: 354.

Flowers very irregular; petals 3; stamens usually 8; low herbs. Fam. 56. *Polygalaceae.* 2: 355.

Flowers regular, often apetalous, small, monoecious or dioecious; carpels mostly 3; herbs or low shrubs, mostly with milky juice. Fam. 57. *Euphorbiaceae.* 2: 361.

Stamen only 1; perianth none; styles 2; small aquatic or rarely terrestrial plants with opposite entire leaves. Fam. 58. *Callitrichaceae.* 2: 381.

‡ ‡ Ovules pendulous, with the raphe away from the axis of the ovary, or erect or ascending. Order 17. SAPINDALES.

a. Flowers regular, or nearly so (except in Hippocastanaceae, which are trees or shrubs with digitately compound leaves).

Petals none (or 3 in *Empetrum*); flowers monoecious or dioecious; leaves evergreen.

Stamens mostly 3; low heath-like shrubs. Fam. 59. *Empetraceae.* 2: 383.

Stamens 4–7; our species an herb with broad leaves and spiked flowers. Fam. 60. *Buxaceae.* 2: 384.

Petals present; leaves deciduous, except in Cyrillaceae and some Ilicaceae.
Low annual herbs, with pinnately divided leaves, the stamens twice as many as the petals. Fam. 61. *Limnanthaceae.* 2: 385.
Trees or shrubs, or rarely herbaceous vines.
Ovary 1-celled (in ours); fruit a small drupe. Fam. 62. *Anacardiaceae.* 2: 385.
Ovary 2-several-celled.
Leaves simple, pinnately veined.
Seeds not arilled.
Fruit dry; flowers racemed, perfect. Fam. 63. *Cyrillaceae.* 2: 389.
Fruit a small drupe; flowers not racemed, mostly polygamo-dioecious; ovules pendulous. Fam. 64. *Ilicaceae.* 2: 390.
Seeds arilled; ovules erect; capsule fleshy. Fam. 65. *Celastraceae.* 2: 393.
Leaves simple and palmately veined, or compound.
Leaves opposite.
Fruit a bladdery 3-lobed capsule. Fam. 66. *Staphyleaceae.* 2: 396.
Fruit of 2 winged samaras. Fam. 67. *Aceraceae.* 2: 396.
Fruit a leathery capsule; flowers irregular; leaves digitately compound. Fam. 68. *Hippocastanaceae.* 2: 400.
Leaves alternate; fruit various. Fam. 69. *Sapindaceae.* 2: 402.
b. Flowers very irregular, the posterior sepal large, saccate; succulent herbs, the capsule elastically dehiscent. Fam. 70. *Balsaminaceae.* 2: 403.
† † Stamens as many as the sepals and alternate with them, opposite the petals when these are present; ovules erect. Order 18. RHAMNALES.
Shrubs, small trees, or vines; petals 4 or 5, or none; fruit a drupe or capsule. Fam. 71. *Rhamnaceae.* 2: 404.
Vines, climbing by tendrils, rarely shrubs; petals caducous; fruit a berry. Fam. 72. *Vitaceae.* 2: 407.
* * Stamens usually very numerous (except in some Hypericaceae, in Elatinaceae, Violaceae and Passifloraceae); disk inconspicuous or none.
† Sepals valvate; placentae united in the axis of the capsule. Order 19. MALVALES.
Stamens in several sets; anthers 2-celled; embryo straight. Fam. 73. *Tiliaceae.* 2: 413.
Stamens monadelphous; anthers 1-celled; embryo curved. Fam. 74. *Malvaceae.* 2: 415.
† † Sepals or calyx-segments imbricated or convolute (except in Loasaceae, in which the calyx-tube is adnate to the ovary); placentae mainly parietal, sometimes united in the axis. Order 20. PARIETALES.
Sepals distinct, mostly persistent.
Endosperm little or none.
Trees or shrubs with alternate leaves, and large solitary axillary flowers. Fam. 75. *Theaceae.* 2: 426.
Herbs or low shrubs with opposite, rarely verticillate leaves.
Leaves punctate or black-dotted, exstipulate. Fam. 76. *Hypericaceae.* 2: 427.
Leaves stipulate; minute or small marsh or aquatic herbs with axillary flowers. Fam. 77. *Elatinaceae.* 2: 437.
Endosperm copious.
Flowers regular, but the 2 outer sepals smaller; stamens numerous; ovules orthotropous. Fam. 78. *Cistaceae.* 2: 439.
Flowers irregular, some often cleistogamous; stamens 5; ovules anatropous. Fam. 79. *Violaceae.* 2: 445.
Sepals more or less united into a gamosepalous calyx.
A fringed crown in the throat of the calyx; our species vines; stamens 5; ovary free from the calyx. Fam. 80. *Passifloraceae.* 2: 457.
No crown; our species herbs; stamens numerous; ovary adnate to the calyx. Fam. 81. *Loasaceae.* 2: 458.
II. *Ovary inferior, adnate to the calyx, wholly, or in part* (except in Lythraceae and our Melastomaceae, where it is usually merely enclosed by it, and in Thymeleaceae and Elaeagnaceae, which are shrubs or trees, with no corolla).
1. Fleshy spiny plants, with jointed stems, the leaves very small, or none; calyx-segments and petals very numerous. Order 21. OPUNTIALES.
One family. Fam. 82. *Cactaceae.* 2: 460.
2. Herbs, shrubs or trees, not fleshy nor spiny; calyx-segments and petals (when present) rarely more than 5.
Petals none in our species; shrubs or trees; ovary 1-ovuled. Order 22. THYMELEALES.
Leaves green; seed pendulous. Fam. 83. *Thymeleaceae.* 2: 465.
Leaves silver-scurfy; seed erect. Fam. 84. *Elaeagnaceae.* 2: 466.
Petals present (except in some Haloragidaceae, which are small aquatic herbs).
Ovules several or numerous in each cavity of the ovary (except in Haloragidaceae and Trapaceae). Order 23. MYRTALES (*Myrtiflorae*).
Land or marsh plants, or, if aquatic, submerged leaves not dissected.
Calyx-tube merely enclosing the ovary, but free from it, except at the base.)
Anthers longitudinally dehiscent. Fam. 85. *Lythraceae.* 2: 468.
Anthers opening by a terminal pore. Fam. 86. *Melastomaceae.* 2: 473.
Calyx-tube almost wholly adnate to the ovary. Fam. 87. *Onagraceae.* 2: 475.
Aquatic or amphibious herbs, the submerged leaves dissected (except in *Hippuris*, which has whorled narrow leaves and only 1 stamen).
Petioles of the broad floating leaves inflated; flowers rather large, white. Fam. 88. *Trapaceae.* 2: 500.
Leaves most sessile; petioles, if present, not inflated; flowers small, greenish; seeds with 1 coat. Fam. 89. *Haloragidaceae.* 2: 500.
Ovules 1 in each cavity of the ovary. Order 24. UMBELLALES (*Umbelliflorae*).
Stamens 5; styles 2–5, rarely united; flowers umbellate or capitate.
Fruit a fleshy berry or drupe. Fam. 90. *Araliaceae.* 2: 505.
Fruit dry when mature, splitting into two mericarps. Fam. 91. *Umbelliferae.* 2: 508.
Stamens 4; style 1; stigma 1; shrubs and trees; flowers not umbellate. Fam. 92. *Cornaceae.* 2: 542.

Series 2. GAMOPETALAE. 2: 548 to 3: 493.

Petals more or less united. (See exceptions noted on page 548, Vol. 2.)

A. Ovary superior (except in Vacciniaceae and Symplocaceae, in which it is partly or wholly inferior.)

I. Stamens mostly free from the corolla, or adnate merely to its base (at the sinuses of the corolla in *Diapensia* and *Pyxidanthera* of the Diapensiaceae), as many as the lobes and alternate with them, or twice as many. Order 1. ERICALES.

Stamens free from the corolla, or merely adnate to its base, not united into a tube.
Ovary superior; fruit a capsule, or rarely drupaceous.
Corolla essentially polypetalous.
Ovary 3-celled; shrubs; leaves deciduous. Fam. 1. *Clethraceae.* 2: 548.
Ovary 4-5-celled; low, mostly evergreen perennials. Fam. 2. *Pyrolaceae.* 2: 549.
Corolla distinctly gamopetalous (except in *Monotropa* and *Hypopitys* of the Monotropaceae and *Ledum* of the Ericaceae).
Herbaceous saprophytes without green leaves. Fam. 3. *Monotropaceae.* 2: 554.
Shrubs with normal, often evergreen leaves. Fam. 4. *Ericaceae.* 2: 556.
Ovary inferior, adnate to the calyx, forming a many-seeded berry in fruit.
Fam. 5. *Vacciniaceae.* 2: 573.
Stamens borne at the sinuses of the corolla, or united in a 10-lobed tube.
Fam. 6. *Diapensiaceae.* 2: 582.

II. Stamens borne on the corolla, as many as its lobes and opposite them, or twice as many, or more.
Herbs. Order 2. PRIMULALES.
Style 1; fruit a capsule. Fam. 7. *Primulaceae.* 2: 584.
Styles 5; fruit an achene or utricle. Fam. 8. *Plumbaginaceae.* 2: 594.
Shrubs or trees. Order 3. EBENALES.
Stamens as many as the corolla-lobes. Fam. 9. *Sapotaceae.* 2: 595.
Stamens twice as many as the corolla-lobes, or more.
Styles 2-8; flowers mostly monoecious or dioecious. Fam. 10. *Ebenaceae.* 2: 596.
Style 1, simple or lobed; flowers mostly perfect.
Stamens in several series. Fam. 11. *Symplocaceae.* 2: 597.
Stamens in 1 series. Fam. 12. *Styracaceae.* 2: 598.

III. Stamens borne on the corolla, as many as its lobes or fewer, and alternate with them (In our species of *Fraxinus* and *Adelia* of the Oleaceae there is no corolla).

* *Corolla not scarious, nerved.*

† Ovaries 2, distinct (except in some Loganiaceae, and in Gentianaceae and Menyanthaceae, in which the ovary is compound, with 2 cavities, or rarely more, or with 1 cavity and 2 placentae); flowers regular; stamens mostly adnate to only the lower part of the corolla; leaves mostly opposite.
Order 4. GENTIANALES (*Contortae*).

a. Stamens (usually 2), fewer than the corolla-lobes, or corolla none; our species trees or shrubs. Fam. 13. *Oleaceae.* 2: 600.

b. Stamens as many as the corolla-lobes; mostly herbs.

Stigmas distinct; juice not milky; ovary 1, compound.
Ovary 2-celled; leaves stipulate, or their bases connected by a stipular line.
Fam. 14. *Loganiaceae.* 2: 604.
Ovary 1-celled; leaves not stipulate.
Leaves opposite or rarely verticillate; corolla-lobes convolute or imbricated in the bud.
Fam. 15. *Gentianaceae.* 2: 606.
Leaves basal or alternate; corolla-lobes induplicate-valvate in the bud; marsh or aquatic herbs. Fam. 16. *Menyanthaceae.* 2: 621.
Stigmas united; juice milky; ovaries 2 in our species.
Styles united; stamens distinct; pollen of simple grains. Fam. 17. *Apocynaceae.* 3: 1.
Styles distinct; stamens mostly monadelphous; pollen-grains united into waxy masses.
Fam. 18. *Asclepiadaceae.* 3: 4.

†† Ovary 1, compound (2-divided in *Dichondra* of the Convolvulaceae; in Boraginaceae and Labiatae mostly deeply 4-lobed around the style) flowers regular or irregular; stamens mostly adnate to the middle of the corolla-tube or beyond; leaves opposite or alternate.
Order 5. POLEMONIALES (*Tubiflorae*).

a. Corolla regular (irregular in *Echium* of the Boraginaceae).

Ovary not 4-lobed, the carpels not separating as separate nutlets at maturity.
Ovary 2-celled, rarely 3-4-celled; style 1, entire, 2-cleft, or 2-parted; mostly twining vines.
Leaves normal. Fam. 19. *Convolvulaceae.* 3: 19.
White or yellowish parasitic vines, the leaves reduced to minute scales.
Fam. 20. *Cuscutaceae.* 3: 27.
Ovary 3-celled; stigmas 3, linear; herbs, not twining. Fam. 21. *Polemoniaceae.* 3: 31.
Ovary 1-celled (2-celled in *Nama*); style 1, 2-lobed, or 2-parted; herbs, not twining.
Fam. 22. *Hydrophyllaceae.* 3: 43.
Ovary deeply 4-lobed around the style, or not lobed (*Heliotropium*); carpels separating as nutlets.
Fam. 23. *Boraginaceae.* 3: 50.

b. Corolla irregular, more or less 2-lipped (regular in Solanaceae, in *Mentha* and *Lycopus* of the Labiatae, and nearly or quite so in *Verbena* and *Callicarpa* of the Verbenaceae).

1. Carpels 1-2-seeded.

Ovary not lobed, 2-4-celled, the style apical; carpels separating into 1-seeded nutlets.
Fam. 24. *Verbenaceae.* 3: 69.
Ovary 4-lobed around the style, the lobes ripening into 1-seeded nutlets.
Fam. 25. *Labiatae.* 3: 74.

2. Carpels several–many-sceded (2-seeded in some Acanthaceae).

‡ Fruit a berry, or more commonly a capsule which is 1–2-celled, 2-valved, circumscissile, or irregularly bursting, not elastically dehiscent.

Placentae axile.

Ovary 2-celled, or rarely 3-5-celled.

Flowers regular; fertile stamens 5 (4 in *Petunia*); fruit a berry or capsule. Fam. 26. *Solanaceae.* 3: 124.

Flowers more or less irregular; fertile stamens 2 or 4 (5 in *Verbascum*); fruit a capsule. Fam. 27. *Scrophulariaceae.* 3: 142.

Ovary 1-celled; marsh or aquatic herbs with flowers on scapes. Fam. 28. *Lentibulariaceae.* 3: 188.

Placentae parietal.

Herbs, parasitic on the roots of other plants, the leaves reduced to scales, not green; ovary 1-celled. Fam. 29. *Orobanchaceae.* 3: 194.

Trees, vines, shrubs, or herbs, the foliage normal.

Trees, shrubs, or woody vines; capsule 2-celled; seeds winged in our genera. Fam. 30. *Bignoniaceae.* 3: 198.

Opposite-leaved herbs; capsule 1-celled in our genus; seeds wingless. Fam. 31. *Martyniaceae.* 3: 200.

‡ ‡ Capsule completely 2-celled, elastically loculicidally dehiscent; opposite-leaved herbs; placentae axile. Fam. 32. *Acanthaceae.* 3: 201.

3. Ovary and fruit 1-celled with 1 erect orthotropous ovule and seed; herb with spicate flowers and reflexed fruits. Fam. 32*. *Phrymaceae.* 3: 205.

* * *Corolla scarious, nerveless.* Order 6. PLANTAGINALES.

Herbs with small spicate or capitate flowers; one family. Fam. 33. *Plantaginaceae.* 3: 205.

B. Ovary inferior.

I. *Anthers distinct.*

Stamens as many as the corolla-lobes and alternate with them (one fewer in *Linnaea* of the Caprifoliaceae), or twice as many; ovary compound, with 1 ovule or more in each cavity; leaves opposite, or verticillate. Order 7. RUBIALES.

Stamens as many as the corolla-lobes.

Leaves always stipulate, usually blackening in drying. Fam. 34. *Rubiaceae.* 3: 211.

Leaves usually exstipulate, not blackening in drying. Fam. 35. *Caprifoliaceae.* 3: 227.

Stamens twice as many as the corolla-lobes; low herb with ternately divided leaves. Fam. 36. *Adoxaceae.* 3: 242.

Stamens mostly fewer than the corolla-lobes; ovary 1-celled with 1 pendulous ovule, or 3-celled with 2 of the cavities without ovules. Order 8. VALERIANALES (*Aggregatae*).

Ovary 3-celled; 2 cavities empty. Fam. 37. *Valerianaceae.* 3: 243.

Ovary 1-celled; flowers densely capitate, involucrate. Fam. 38. *Dipsacaceae.* 3: 247.

II. *Anthers united* (except in *Campanula* and *Legouzia* of the Campanulaceae, in Ambrosiaceae, and in *Kuhnia* of the Compositae. Order 9. CAMPANULALES (*Campanulatae*).

Flowers not in involucrate heads; juice mostly milky.

Endosperm none; flowers monoecious or dioecious; our species vines. Fam. 39. *Cucurbitaceae.* 3: 249.

Endosperm present, fleshy; flowers perfect. Fam. 40. *Campanulaceae.* 3: 252.

Flowers in involucrate heads.

Flowers all expanded into rays (ligulate); juice milky. Fam. 41. *Cichoriaceae.* 3: 261.

Flowers all tubular, or the outer expanded into rays; juice very rarely milky.

Stamens distinct, or nearly so. Fam. 42. *Ambrosiaceae.* 3: 292.

Stamens united by their anthers into a tube around the style (except in *Kuhnia*). Fam. 43. *Compositae.* 3: 298.

ILLUSTRATED FLORA.

VOL. III.

Family 17. **APOCYNÀCEAE** Lindl. Nat. Syst. Ed. 2, 299. 1836.

DOGBANE FAMILY.

Perennial herbs, shrubs, vines, or some tropical genera trees, mostly with an acrid milky juice, with simple opposite alternate or verticillate exstipulate leaves, and perfect regular 5-parted cymose solitary or paniculate flowers. Calyx inferior, persistent, the lobes imbricated in the bud. Corolla gamopetalous, its lobes convolute in the bud and often twisted. Stamens as many as the lobes of the corolla, alternate with them, inserted on the tube or throat; anthers linear-oblong, or sagittate, 2-celled; pollen-grains simple, often glutinous. Ovary superior, or its base adherent to the calyx, of 2 distinct carpels, or 1-celled, with 2 parietal placentae, or 2-celled; ovules few or numerous, anatropous or amphitropous; style simple, or 2-divided; stigma simple. Fruit usually of 2 follicles or drupes. Seeds often appendaged by a coma; endosperm fleshy, not copious; embryo straight; cotyledons flat or concave; radicle terete, usually shorter than the cotyledons.

About 130 genera and 1050 species, very widely distributed, mostly in tropical regions.

Leaves alternate; erect herbs.	1. *Amsonia.*
Leaves opposite; vines or herbs.	
Flowers large, axillary, solitary.	2. *Vinca.*
Flowers small, cymose.	
Erect or diffuse herbs; corolla campanulate.	3. *Apocynum.*
High-climbing vines; corolla funnelform.	4. *Trachelospermum.*

1. **AMSÒNIA** Walt. Fl. Car. 98. 1788.

Perennial herbs, with alternate membranous leaves, and rather large blue or bluish flowers, in terminal thyrsoid or corymbose cymes. Calyx 5-parted, the segments narrow, acuminate. Corolla mostly salver-form, the tube cylindric, but somewhat dilated at the summit, villous within, the lobes convolute in the bud. Stamens inserted on the throat of the corolla, included; anthers ovate or oblong. Disk none. Ovary of 2 carpels, connected at the top by the filiform style; ovules in 2 rows in each cavity, numerous; stigma appendaged by a reflexed membrane. Fruit of 2 erect cylindric several-seeded follicles. Seeds cylindric or oblong, obliquely truncate at each end, not appendaged. [Named for Charles Amson of South Carolina.]

About 8 species, natives of North America and eastern Asia. Besides the following, 5 others occur in the southern and southwestern United States.

1. Amsonia Amsònia (L.) Britton. Amsonia. (Fig. 2893.)

Tabernaemontana Amsonia L. Sp. Pl. Ed. 2, 308. 1762.
Amsonia Tabernaemontana Walt. Fl. Car. 98. 1788.
A. Amsonia Britton, Mem. Torr. Club, 5: 262. 1894.

Glabrous or nearly so, simple, or branched above, 2°–4° high. Leaves ovate, ovate-lanceolate or lanceolate, entire, acuminate at the apex, narrowed at the base, sometimes pubescent beneath, 2′–5′ long, ½′–2′ wide; petioles 2″–4″ long; flowers thyrsoid-cymose, numerous; pedicels bracteolate at the base; calyx about 1″ long, its segments subulate; corolla 6″–9″ long, beaked by the convolute limb in the bud, its lobes linear and about as long as the tube; follicles 2′–4′ long, about 2″ thick, attenuate at the apex, glabrous; seeds papillose.

In moist soil, southern Pennsylvania to Illinois and Kentucky, south to Florida, Missouri and Texas. April–July.

2. VÍNCA L. Sp. Pl. 209. 1753.

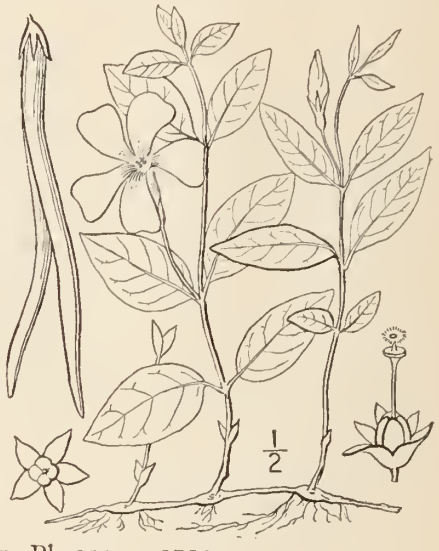
Erect or trailing herbs, some species slightly woody, with opposite leaves, and large solitary blue pink or white axillary flowers. Calyx 5-parted, the segments narrow, acuminate. Corolla salverform, the tube cylindric, or expanded above, pubescent within, the lobes convolute, at least in the bud, oblique. Stamens included. Disk of 2 glands, alternate with the 2 carpels. Ovules several in each carpel; style filiform; stigma annular, its apex penicillate. Follicles 2, erect or spreading, cylindric, several-seeded. Seeds oblong-cylindric, truncate at each end, not appendaged. [The Latin name.]

About 12 species, one native of tropical America, occurring in Florida, the others of the Old World.

1. Vinca mìnor L. Periwinkle. Myrtle. (Fig. 2894.)

Vinca minor L. Sp. Pl. 209. 1753.

Perennial, trailing, glabrous; stems 6′–2° long. Leaves oblong to ovate, entire, firm, green both sides, obtuse or acutish at the apex, narrowed at the base, short-petioled, 1′–2½′ long, ½′–1′ wide; flowers not numerous, solitary in some of the axils, blue, 9″–15″ broad; peduncles slender, ½′–1½′ long; calyx very deeply parted, the segments subulate-lanceolate, glabrous, about 1½′ long; corolla-tube expanded above, as long as or slightly longer than the obovate, nearly truncate lobes; anther-sacs with a broad connective; follicles few seeded.



Escaped from gardens to roadsides and woods, Ontario to southern New York and New Jersey. Native of Europe. Leaves shining. Also called Running Myrtle. Feb.–May.

3. APÓCYNUM L. Sp. Pl. 213. 1753.

Perennial branching herbs, with opposite entire leaves, and small white or pink flowers in terminal and sometimes axillary corymbed cymes. Calyx 5-parted, the segments acute. Corolla campanulate, the tube bearing within 5 small triangular appendages alternate with the stamens, the limb 5-lobed. Stamens inserted on the base of the corolla; anthers sagittate, connivent around the stigma and slightly adherent to it. Disk 5-lobed. Ovary of 2 carpels; ovules numerous in each carpel; stigma ovoid, obtuse, obscurely 2-lobed. Follicles slender, elongated, terete. Seeds numerous, small, the apex tipped with a long coma. [Greek, dog-bane.]

About 8 species, of the north temperate zone.

Branches divergent; corolla-tube longer than the calyx, its lobes revolute. 1. *A. androsaemifolium.*
Branches erect or ascending; corolla-tube not longer than the calyx, its lobes nearly erect.
  Leaves and cymes glabrous or somewhat pubescent.
    Leaves petioled, narrowed at base, or the lower obtuse or subcordate. 2. *A. cannabinum.*
    Leaves mostly cordate-clasping or obtuse at the base, nearly sessile. 3. *A. hypericifolium.*
  Whole plant, including the cymes, densely pubescent. 4. *A. pubescens.*

1. Apocynum androsaemifòlium L. Spreading Dogbane. Honey-bloom. (Fig. 2895.)

Apocynum androsaemifolium L. Sp. Pl. 213. 1753.

Rootstock horizontal; stem 1°–4° high; branches broadly spreading, mostly glabrous. Leaves ovate or oval, acute or obtuse and mucronate at the apex, rounded or narrowed at the base, glabrous above, pale and usually more or less pubescent beneath, 2′–4′ long, 1′–2½′ wide; petioles 2″–4″ long; cymes loose; pedicels 2″–3″ long, subulate-bracted at the base; flowers about 4″ broad; calyx-segments shorter than the tube of the pinkish corolla; corolla-lobes revolute; follicles about 4′ long, narrowed at the apex.

In fields and thickets, Anticosti to British Columbia, south to Georgia, Nebraska and Arizona. Ascends to 3500 ft. in Virginia. Called also Bitter-root. June–July.

2. Apocynum cannábinum L. Indian Hemp. Amy-root. (Fig. 2896.)

Apocynum cannabinum L. Sp. Pl. 213. 1753.

Root deep, vertical, soon branching. Stem extensively branched, the branches erect or ascending, glabrous or nearly so, more or less glaucous. Leaves oblong, lanceolate-oblong or ovate-oblong, acute or obtuse and mucronate at the apex, narrowed or rounded at the base, glabrous above, sometimes pubescent beneath, 2′–6′ long, ½′–3′ wide; petioles 1″–6″ long, or sometimes none; cymes dense; pedicels short, bracteolate at the base; flowers 2½″–3½″ broad; calyx-segments nearly as long as the tube of the greenish-white corolla; corolla-lobes nearly erect; follicles similar to those of the preceding species.

In fields and thickets, Anticosti to British Columbia, Florida and Lower California. June–Aug.

Apocynum cannábinum glabérrimum DC. Prodr. 8: 439. 1844.

Glabrous; leaves smaller, oblong-lanceolate, acute at each end, or sometimes rounded at the base, seldom over 2½′ long and 10″ wide, distinctly petioled. On river-shores and similar situations; range apparently nearly of the type, but more abundant northward.

3. Apocynum hypericifòlium Ait. Clasping-leaved Dogbane. (Fig. 2897.)

Apocynum hypericifolium Ait. Hort. Kew. 1: 304. 1789.

Apocynum cannabinum var. *hypericifolium* A. Gray, Man. 365. 1848.

Glabrous, often glaucous; stem 1°–2° high, the branches ascending. Leaves oblong, oblong-lanceolate to oval, 1′–3′ long, ½′–1½′ wide, obtuse or acutish at the apex, cordate-clasping, rounded, truncate, or the upper narrowed at the base, very short-petioled, or sessile, the primary venation forming broad angles with the midvein; cymes many-flowered, dense to loose; pedicels mostly not longer than the flowers, bracteolate; calyx-segments about the length of the corolla-tube, lanceolate, acute; corolla-lobes nearly erect; follicles 2′–3½′ long.

In dry soil, or along streams, Ontario to British Columbia, Ohio, Illinois and New Mexico. June–Aug.

4. Apocynum pubéscens R. Br. Velvet Dogbane. (Fig. 2898.)

Apocynum pubescens R. Br. Mem. Wern. Soc. 1: 68. 1811.

Apocynum cannabinum var. *pubescens* A. DC. Prodr. 8: 440. 1844.

Whole plant, including the pedicels and calyx, densely velvety-pubescent. Branches ascending; leaves oval to elliptic, obtuse or acute at the apex, strongly mucronate, obtuse or obtusish at the base, the veins impressed in the pubescence of the lower surface; petioles 1″–2″ long; cymes dense; calyx-segments about as long as the tube of the corolla, lanceolate, acute; corolla apparently purple, its lobes erect; fruit not seen.

Original from "Virginia, herb. Mitchell." The only specimen seen by us was collected by Dr. C. C. Parry in Polk Co., Iowa, July, 1867.

4. TRACHELOSPÉRMUM Lemaire, Jard. Fleur. 1: *pl. 61.* 1851.

Twining woody vines (some exotic species nearly erect shrubs), with opposite entire deciduous leaves, and small yellow greenish or white flowers in terminal and axillary compound cymes. Calyx small, deeply 5-parted, glandular within, the segments narrow. Corolla funnelform or salverform, the tube nearly cylindric, expanded above, the lobes convolute, more or less twisted. Stamens included, or short exserted; anthers sagittate, acuminate, connivent around the stigma and slightly adherent to it. Disk of 5 glandular lobes. Ovary of 2 carpels; ovules numerous in each carpel; style slender, its apex thickened below the narrow ring of the ovoid stigma. Follicles much elongated, slender. Seeds linear, not beaked, long-comose at the apex. [Greek, neck-seed, but the seed is not beaked.]

About 6 species, natives of eastern Asia and North America. The following is the only known North American species.

1. Trachelospermum diffórme (Walt.) A. Gray. Trachelospermum. (Fig. 2899.)

Echites difformis Walt. Fl. Car. 98. 1788.
Forsteronia difformis A. DC. Prodr. 8: 437. 1844.
T. difforme A. Gray, Syn. Fl. 2: Part 1, 85. 1878.

A high-climbing vine, the stems ½′ in diameter or more, the twigs pubescent or glabrous. Leaves thin, ovate, oval or lanceolate, acuminate or acute at the apex, narrowed or rarely rounded at the base, 1½′–3′ long, ½′–2′ wide; petioles 2″–4″ long; peduncles slender, shorter than the leaves; pedicels and branches of the cyme bracteolate at the base; flowers yellow or cream-color, 4″–5″ long; lobes of the corolla ovate, spreading, shorter than the tube; follicles very slender, 5′–9′ long, scarcely 2″ thick.

In moist woods and along streams, Delaware to Florida, Texas and Mexico, mostly near the coast. June–Aug.

Family 18. ASCLEPIADÀCEAE Lindl. Nat. Syst. Ed. 2, 302. 1836.*

Milkweed Family.

Perennial herbs, vines or shrubs, mostly with milky juice, with opposite alternate or verticillate exstipulate leaves, and mostly umbellate perfect regular flowers. Calyx inferior, its tube very short, or none, its segments imbricated or separate in the bud. Corolla campanulate, urceolate, rotate or funnelform, 5-lobed or 5-cleft, the segments commonly reflexed. A 5-lobed or 5-parted crown (corona) between the corolla and the stamens and adnate to one or the other. Stamens 5, inserted on the corolla, usually near its base; filaments short, stout, mostly monadelphous, or distinct; anthers attached by their bases to the filaments, introrsely 2-celled, connivent around the stigma, or more or less united with each other; anther-sacs tipped with an inflexed or erect scarious membrane, or unappendaged at the top, sometimes appendaged at the base; pollen coherent into waxy or granular masses, one or rarely two such masses in each sac, connected with the stigma in pairs or fours, by 5 glandular corpuscles alternate with the anthers. Disk none. Ovary of 2 carpels; styles 2, short, connected at the summit by the peltate discoid stigma; ovules numerous in each carpel, mostly anatropous, pendulous. Fruit of 2 several–many-seeded follicles. Seeds compressed, usually appendaged by a long coma; endosperm cartilaginous, mostly thin; embryo nearly as long as the seed; cotyledons flat.

About 220 genera and 1900 species of very wide geographic distribution, most abundant in tropical or warm-temperate regions.

Erect or decumbent herbs.
- Corona-hoods each with an incurved horn within; leaves mostly opposite. 1. *Asclepias.*
- Corona-hoods prominently crested within; leaves alternate. 2. *Asclepiodora.*
- Corona-hoods unappendaged or with a thickened crest-like keel; leaves opposite or alternate. 3. *Acerates.*

Twining vines.
- Corolla-lobes erect; corona-lobes 1–2-awned. 4. *Ampelanus.*
- Corolla rotate.
  - Anthers tipped with a scarious membrane; pollen-masses pendulous. 5. *Cynanchum.*
  - Anthers merely tipped; pollen-masses horizontal. 6. *Vincetoxicum.*

*Text revised by Miss Anna Murray Vail.

1. ASCLÉPIAS L. Sp. Pl. 214. 1753.

Perennial erect or decumbent herbs, with opposite verticillate or rarely alternate entire leaves, and middle-sized or small flowers in terminal or axillary umbels. Calyx 5-parted or 5-divided, usually small, the segments or sepals acute, often glandular within. Corolla deeply 5-parted, the segments mostly valvate, reflexed in anthesis. Corona-column generally present. Corona of 5 concave erect or spreading hoods, each bearing within a slender or subulate incurved horn, either included or exserted. Filaments connate into a tube; anthers tipped with an inflexed membrane, winged, the wings broadened below the middle; pollen-masses solitary in each sac, pendulous on their caudicles. Stigma nearly flat, 5-angled or 5-lobed. Follicles usually thick, acuminate. Seeds comose in all but one species. [Dedicated to AEsculapius.]

About 85 species, mostly natives of the New World; besides the following some 25 others occur in southern and western North America. Known as Milkweed, Silkweed, or Swallow-wort.

* Corolla and corona orange; leaves alternate or opposite.

Stem erect or ascending; leaves nearly all alternate. 1. *A. tuberosa.*
Stems reclining; leaves, at least the upper, opposite, oblong or oval. 2. *A. decumbens.*

* * Corolla bright red or purple; leaves opposite.

Flowers 4″–6″ broad; corona-hoods 2″–3″ high.
Leaves lanceolate or linear; hoods oblong, obtuse. 3. *A. lanceolata.*
Leaves ovate or ovate-lanceolate; hoods lanceolate. 4. *A. rubra.*
Leaves oblong, ovate or ovate-oblong; hoods oblong, acutish. 5. *A. purpurascens.*
Flowers 2″–3″ broad; corona-hoods 1″–1½″ high.
Plant nearly or quite glabrous; leaves lanceolate or oblong-lanceolate. 6. *A. incarnata.*
Plant pubescent; leaves oblong. 7. *A. pulchra.*

* * * Corolla greenish, purplish, yellowish or white; leaves opposite or verticillate.

Leaves ovate, oblong, ovate-lanceolate, obovate or orbicular.
Plants glabrous throughout, or minutely pubescent above.
Leaves sessile, clasping or very short-petioled.
Peduncles of the solitary or several umbels short.
Leaves ovate-oblong; hoods 2-auriculate at the base. 8. *A. Sullivantii.*
Leaves nearly orbicular; hoods truncate. 9. *A. latifolia.*
Peduncle of the usually solitary umbel elongated.
Leaves cordate-clasping, wavy-margined. 10. *A. obtusifolia.*
Leaves sessile, flat; horn not exceeding the hood. 11. *A. Meadii.*
Leaves manifestly petioled.
Corolla greenish; umbels loose, the pedicels drooping. 12. *A. exaltata.*
Corolla white; umbels dense. 13. *A. variegata.*
Corolla pink; some of the leaves verticillate in 4's. 14. *A. quadrifolia.*
Plants, at least the lower surfaces of the leaves, canescent or tomentose.
Follicles tomentose, covered with soft spinose processes.
Corona-hoods obtuse, short. 15. *A. Syriaca.*
Corona-hoods elongated, lanceolate. 16. *A. speciosa.*
Follicles with no spinose processes, glabrous or pubescent.
Leaves wavy-margined; corolla-segments 4″–5″ long. 17. *A. arenaria.*
Leaves flat; corolla-segments 2″–3″ long. 18. *A. ovalifolia.*
Leaves lanceolate, oblong-lanceolate or linear.
Leaves opposite, lanceolate or oblong-lanceolate.
Leaves thick, short-petioled; inflorescence woolly. 19. *A. brachystephana.*
Leaves thin, slender-petioled; inflorescence downy. 20. *A. perennis.*
Leaves mostly verticillate in 3's-6's, narrowly linear. 21. *A. verticillata.*
Leaves scattered, densely crowded, filiform-linear. 22. *A. pumila.*

1. Asclepias tuberòsa L. Butterfly-weed. Pleurisy-root. (Fig. 2900.)

Asclepias tuberosa L. Sp. Pl. 217. 1753.

Hirsute-pubescent; stems rather stout, simple, or branched near the summit, ascending or erect, very leafy, 1°–2° high, the milky sap scanty. Leaves usually all alternate, lanceolate or oblong, acute or sometimes obtuse at the apex, narrowed, rounded or cordate at the base, sessile or short-petioled, 2′–6′ long, 2″–12″ wide; umbels cymose at the ends of the stem or branches, many-flowered; peduncles shorter than the leaves; pedicels pubescent, ½′–1′ long; corolla-segments oblong, obtuse, about 3″ long, greenish-orange; corona-column about ½″ long; hoods erect, oblong, bright orange, or rarely yellow, 2–3 times as long as the stamens, slightly longer than the filiform horns; fruiting pedicels decurved; follicles nearly erect, finely pubescent, 4′–5′ long.

In dry fields, Maine and Ontario to Minnesota, Florida, Texas and Arizona. June–Sept. Called also Wind-root, Orange-root.

2. Asclepias decúmbens L. Decumbent Butterfly-weed. (Fig. 2901.)

Asclepias decumbens L. Sp. Pl. 216. 1753.
Asclepias tuberosa var. *decumbens* Pursh, Fl. Am. Sept. 184. 1814.

Hirsute-pubescent; stems decumbent, 2°–3° long, the ends ascending or erect. Leaves sessile or short-petioled, oblong or elliptic, obtuse at the apex, narrowed and often inequilateral at the base, 1′–3′ long, ½′–2¼′ wide, the upper opposite, the lower commonly alternate, the uppermost very small; umbels several or numerous, many-flowered, racemose along the branches, one usually in each of the upper axils; peduncles stout, short; pedicels slender, somewhat pubescent, about ½′ long; corolla-segments oblong, acutish, dark orange, about 3″ long; column about ½″ high, the hoods erect, oblong, orange, slightly longer than the subulate horn; follicles more slender than in the last.

In dry fields, Illinois and Ohio to North Carolina and Florida. June–Aug.

3. Asclepias lanceolàta Walt. Few-flowered Milkweed. (Fig. 2902.)

Asclepias lanceolata Walt. Fl. Car. 105. 1788.
A. paupercula Michx. Fl. Bor. Am. 1: 118. 1803.

Nearly glabrous throughout; stem slender, usually simple, naked above, 2°–4° high. Leaves opposite, distant, linear or narrowly lanceolate, elongated, acuminate, narrowed at the base, short-petioled, 4′–10′ long, 2″–7″ wide, roughish on the margins, the primary nerves widely spreading; umbels few-flowered, solitary or 2–4 at the summit; peduncles about equalling the slender puberulent pedicels; corolla-segments oblong, 4″–5″ long, deep red; column thick, about 1″ high; hoods obovate or oblong, obtuse, orange, 2-toothed near the base, nearly twice the length of the anthers and longer than the subulate incurved horn; anther-wings notched at the base; fruiting pedicels decurved; follicles erect, minutely puberulent, fusiform, about 4′ long.

In swamps, southern New Jersey to Florida and Texas, mostly near the coast. Southern forms with greatly elongated leaves may be distinct. June–Aug.

4. Asclepias rùbra L. Red Milkweed. (Fig. 2903.)

Asclepias rubra L. Sp. Pl. 217. 1753.

Nearly glabrous throughout; stem usually simple, 1°–4° high. Leaves opposite, rather distant, short-petioled, ovate, lanceolate or the lower sometimes oblong, rounded or subcordate at the base, gradually acuminate, rather firm, 3′–8′ long, 1′–2′ wide, the primary nerves wide-spreading; umbels 1–4, many-flowered; peduncles shorter than or equalling the upper leaves; pedicels slender, downy, ½′–1′ long; corolla-segments and hoods lanceolate-oblong, purplish red, or the hoods orange-red, 3″–4″ long; horns of the hoods very slender, nearly straight; fruiting pedicels deflexed, the follicles erect, spindle-shaped, glabrous, about 4′ long.

In moist soil, New Jersey and Pennsylvania to Florida, Louisiana and Texas. The plant of the southern States (*A. laurifolia* Michx.), may be distinct. June–July.

5. Asclepias purpuráscens L. Purple Milkweed. (Fig. 2904.)

Asclepias purpurascens L. Sp. Pl. 214. 1753.

Stem stout, puberulent or glabrous, usually simple, 2°–4° high, leafy to the top. Leaves ovate, elliptic or oblong, petioled, acute or obtuse and mucronulate at the apex, narrowed or rounded at the base, nearly glabrous above, finely tomentose beneath, 3′–8′ long, 1½′–3′ wide, the primary nerves very wide-spreading; umbels many-flowered, borne in several of the upper axils, or sometimes solitary; peduncles stout; pedicels slender, puberulent, 1′–1½′ long; corolla deep purple, its segments oblong, about 3″ long; column very short and thick; hoods oblong or ovate, nearly twice as long as the anthers, pale red or purple, the horns broad at the insertion, short-subulate and incurved at the apex; fruiting pedicels deflexed, the downy follicles nearly erect, 4′–5′ long.

In dry fields and thickets, eastern Massachusetts to Virginia, west to southern Ontario, Minnesota and Kansas. Ascends to 2000 ft. in the Catskills. June–Aug.

6. Asclepias incarnàta L. Swamp Milkweed. (Fig. 2905.)

Asclepias incarnata L. Sp. Pl. 215. 1753.

Glabrous, or puberulent above; stem slender, branched above, or rarely simple, 2°–4° high, leafy to the top. Leaves lanceolate or oblong-lanceolate, acuminate at the apex, narrowed, obtuse or sometimes subcordate at the base, 3′–6′ long, ½′–1½′ wide, the primary nerves not wide-spreading; petioles 3″–6″ long; umbels usually numerous, corymbed, many-flowered; pedicels pubescent, 5″–10″ long; corolla red or rose-purple, rarely white, its lobes oblong, about 2″ long; column more than one-half as long as the obtuse pink or purplish hoods; horns incurved, longer than the hoods; anther-wings entire, or obscurely notched at the base; fruiting pedicels erect or incurved; follicles erect, 2′–3½′ long, sparingly puberulent.

In swamps, New Brunswick to the Northwest Territory, Tennessee, Kansas and Louisiana. Ascends to 3000 ft. in West Virginia. July–Sept.

7. Asclepias púlchra Ehrh. Hairy Milkweed. (Fig. 2906.)

Asclepias pulchra Ehrh.; Willd. Sp. Pl. 1: 1267. 1798.
A. incarnata var. *pulchra* Pers. Syn. 1: 276. 1805.

Similar to the preceding species and perhaps intergrading with it where the two grow together; stem stout, tomentose-pubescent, usually branched, 2°–3½° high, leafy to the top. Leaves broadly lanceolate, acute, acuminate or some of them obtusish at the apex, subcordate, rounded, or the upper narrowed at the base, puberulent or glabrous above, pubescent, at least on the veins beneath, 3′–5′ long, ½′–2′ wide; petioles usually stout and short; flowers similar to those of *A. incarnata*, but the corolla commonly lighter red or pink, rarely white; peduncles and pedicels tomentose; fruiting pedicels erect or incurved; follicles erect, finely and densely pubescent, 2′–3′ long.

In moist fields and swamps, Maine to Minnesota, south to Georgia. July–Sept.

8. Asclepias Sullivántii Engelm. Sullivant's Milkweed. (Fig. 2907.)

A. Sullivantii Engelm.; A. Gray, Man. 366. 1848.

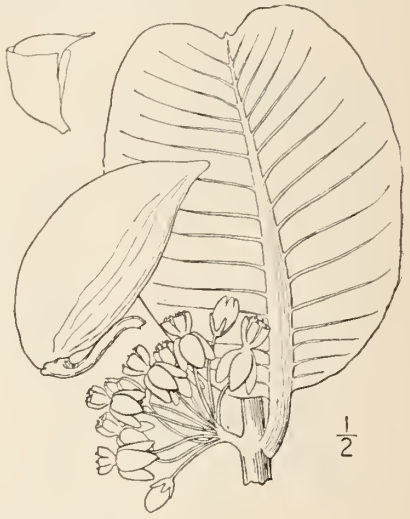
Glabrous throughout; stem stout, simple, or sometimes branched above, 2°–4° high, leafy to the top. Leaves thick, sessile, or on petioles less than 1″ long, oblong or ovate-oblong, usually obtuse and mucronulate at the apex, subcordate, rounded or slightly clasping at the base, 4′–6′ long, 1½′–3′ wide, the primary nerves very wide-spreading; umbels terminal and sometimes also in the upper axils, many-flowered; peduncles shorter than the leaves; corolla-segments oval-oblong, 5″–6″ long, purplish; column very short and thick; hoods oval, obtuse or truncate, gibbous at each side near the base, longer than the anthers and the subulate incurved horn; follicles erect, glabrous, 3′–4′ long, usually with blunt processes near the apex.

In moist soil, Ohio to Minnesota, Nebraska, Missouri and Kansas. July–Sept.

9. Asclepias latifòlia (Torr.) Raf. Broad-leaved Milkweed. (Fig. 2908.)

Asclepias obtusifolia var. *latifolia* Torr. Ann. Lyc. N. Y. 2: 117. 1826.
Asclepias latifolia Raf. Atl. Journ. 146. 1832–33.
A. Jamesii Torr. Bot. Mex. Bound. Surv. 162. 1859.

Minutely puberulent when young, glabrous when old; stem stout, usually simple, 1°–2½° high, very leafy. Leaves very thick, oval to orbicular, sessile or nearly so, commonly broadly emarginate and mucronulate at the apex and cordate or subcordate at the base, 4′–6′ long and nearly as wide, primary nerves very wide-spreading; umbels 2–4, many-flowered, short-peduncled in the upper axils or rarely terminal; pedicels slender, canescent, nearly 1′ long; corolla-segments ovate, acute, 4″–6″ long, greenish; column short and thick; hoods truncate, about equalling the anthers, the horn projecting from a short crest over the edge of the stigma; follicles erect on deflexed pedicels, ovoid, acutish, 2′–3′ long, about 1′ thick.



On dry plains, Kansas to Colorado, Texas and Arizona. July–Sept.

10. Asclepias obtusifòlia Michx. Blunt-leaved Milkweed. (Fig. 2909.)

A. obtusifolia Michx. Fl. Bor Am. 1: 115. 1803.

Nearly glabrous, pale green, somewhat glaucous; stem stout, erect or ascending, 2°–3° high. Leaves sessile or short-petioled, oblong or ovate-oblong, obtuse and mucronulate at the apex, cordate-clasping at the base, 3′–5′ long, 1′–1½′ wide; margins wavy-crisped; primary nerves wide-spreading; umbel many-flowered, usually solitary on the long terminal peduncle, rarely with a second shorter-peduncled one at its base; pedicels slender, downy, about 1′ long; corolla-segments oblong, greenish-purple, about 4″ long; column thick; hoods pink, nearly truncate and toothed at the summit, shorter than the subulate incurved horn, longer than the anthers; follicles erect on the stout decurved fruiting pedicels, downy, 4′–6′ long.

In dry fields, mostly in sandy soil, Maine to Florida, west to northern New York, Minnesota, Kansas and Texas. Ascends to 3000 ft. in Virginia. May–Aug.

11. Asclepias Mèadii Torr. Mead's Milkweed. (Fig. 2910.)

A. Meadii Torr.; A. Gray, Man. Ed. 2, Add. 704. 1856.

Nearly glabrous throughout, pale green or glaucous; stem simple, or rarely branched above, 1°–2° high. Leaves opposite, sessile, flat, mostly distant, ovate, ovate-lanceolate, lanceolate or the lower oblong, acute or sometimes obtuse at the apex, the margins scabrous; umbel solitary, terminal, several-flowered, borne on a peduncle 3′–6′ long; corolla-segments greenish yellow, ovate, acute, 3″–4″ long; column very short, thicker than high; hoods ovate, purplish, nearly twice as long as the anthers, rounded and truncate at the summit, longer than the subulate inflexed horn, with a small tooth at each side on the inner infolded margin; follicles erect on decurved pedicels, minutely puberulent, narrow, 4′–5′ long.

In dry soil, southern Illinois to Iowa. June–Aug.

12. Asclepias exaltàta (L.) Muhl. Poke or Tall Milkweed. (Fig. 2911.)

A. Syriaca var. *exaltata* L. Sp. Pl. Ed. 2, 313. 1762.
Asclepias exaltata Muhl. Cat. 28. 1813.
A. phytolaccoides Pursh, Fl. Am. Sept. 180. 1814.

Nearly glabrous throughout, with two opposite lines of pubescence on the usually simple stem, 3°–6° high. Leaves opposite, thin or membranous, oval, ovate or oblong, acuminate at both ends, 4′–9′ long, 1½′–4′ wide, the lower sometimes obovate, obtuse, shorter; petioles ¼′–1′ long; peduncles 1′–3′ long; umbels usually several; pedicels slender, drooping or spreading, 1′–2′ long, puberulent; corolla green-purple, the segments ovate or oblong, obtusish, 3″–4″ long; column short; hoods white or pink, slightly shorter than the anthers, much shorter than the subulate horn, at the summit truncate and entire or erose, with 1 or 2 slender teeth on each of the inner margins; follicles erect on the deflexed pedicels, downy, long-acuminate, 4′–6′ long.

In thickets and woods, Maine to Minnesota, Georgia and Missouri. Ascends to 5500 ft. in North Carolina. June–Aug.

13. Asclepias variegàta L. White Milkweed. (Fig. 2912.)

Asclepias variegata L. Sp. Pl. 217. 1753.

Stem glabrous below, pubescent above when young, simple, 1°–3° high. Leaves opposite, thick, oval, ovate, oblong or the lower somewhat obovate, obtuse and cuspidate or acutish at the apex, narrowed or rounded at the base, dark green above, pale beneath, 3′–6′ long, 1′–3′ wide, the middle ones sometimes verticillate in 4's; petioles 3″–12″ long; umbels 1–4, terminal, or rarely 1 or 2 in the upper axils, densely many-flowered; peduncles 1′–2′ long; pedicels ½′–1½′ long, erect or ascending, usually densely puberulent; corolla-segments ovate or oval, about 3″ long, white, or purple near the base; column very short and thick, purplish; hoods globose-obovoid, obtuse, spreading, longer than the anthers, about equalling the semi-lunate horizontally pointed horn; follicles downy, erect on the deflexed fruiting pedicels, 4′–5′ long.

In dry woods or thickets, Connecticut, southern New York to Illinois, south to Florida, Arkansas and Louisiana. June–July.

14. Asclepias quadrifòlia Jacq. Four-leaved Milkweed. (Fig. 2913.)

A. quadrifolia Jacq. Obs. Part 2, 8. *pl. 33.* 1767.

Stem slender, simple, 1°–2° high, usually leafless below. Leaves thin, sparingly pubescent on the veins beneath, ovate to lanceolate, 2′–6′ long, ½′–2½′ wide, acute or acuminate, narrowed or rounded at the base, or the lowest pair much smaller, obovate and obtuse, the upper and lower opposite, the middle ones usually verticillate in 4's; umbels 1–4, terminal, or rarely in the upper axils; peduncles slender, ½′–2½′ long; pedicels about 1′ long; corolla pink or nearly white, its lobes lanceolate-oblong, 2″–3″ long; column short; hoods white, obtuse at the apex, broadly 2-toothed above the base, twice as long as the anthers and the incurved horn; follicles erect on the erect fruiting pedicels, 3′–5′ long, glabrous.

Woods and thickets, Maine and Ontario to Minnesota, North Carolina and Arkansas. May–July.

15. Asclepias Syrìaca L. Common Milkweed. Silkweed. (Fig. 2914.)

Asclepias Syriaca L. Sp. Pl. 214. 1753.
Asclepias Cornuti Dec. in DC. Prodr. 8: 564. 1844.

Stem stout, usually simple, 3°–5° high, finely pubescent at least above. Leaves oblong, oval or ovate, densely pubescent beneath, soon glabrous above, acute or obtuse and cuspidate at the apex, obtuse, narrowed or subcordate at the base, 4′–9′ long, 2′–4½′ wide, the primary nerves wide-spreading; petioles stout, 3″–8″ long; umbels several or numerous; peduncles pubescent or tomentose, 1½′–3½′ long; pedicels 1′–2′ long; corolla green-purple, its segments oblong-lanceolate, 3″–4″ long; column short and thick, the hoods ovate-lanceolate with a tooth on each side, longer than the anthers and the incurved horn; follicles 3′–5′ long, erect on recurved pedicels, tomentose and covered with short soft processes.

In fields and waste places, New Brunswick to the Northwest Territory, south to North Carolina and Kansas. Leaves rarely lanceolate. June–Aug.

16. Asclepias speciòsa Torr. Showy Milkweed. (Fig. 2915.)

Asclepias speciosa Torr. Ann. Lyc. N. Y. 2: 218. 1826.
A. Douglasii Hook. Fl. Bor. Am. 2: 53. *pl. 152.* 1834.

White-tomentose or canescent all over, or glabrate below, pale; stem simple, stout, 1°–2½° high. Leaves thick, broadly ovate or oval, obtuse and cuspidate or acute at the apex, subcordate, rounded or narrowed at the base, petioled, 3′–8′ long, 2′–4′ wide; peduncles 1′–3′ long; umbels several or rarely solitary, many-flowered; pedicels stout, 9″–18″ long; corolla purple-green, its segments oblong or ovate-oblong, 4″–6″ long, tomentose on the outer face; column very short or none; hoods lanceolate, 5″–7″ long, obtusish, expanded and with 2 blunt teeth below, the apex ligulate, 5–7 times as long as the anthers; horn short, inflexed; follicles erect or spreading on the recurved fruiting pedicels, 3′–4′ long, densely woolly and covered with soft spinose processes.

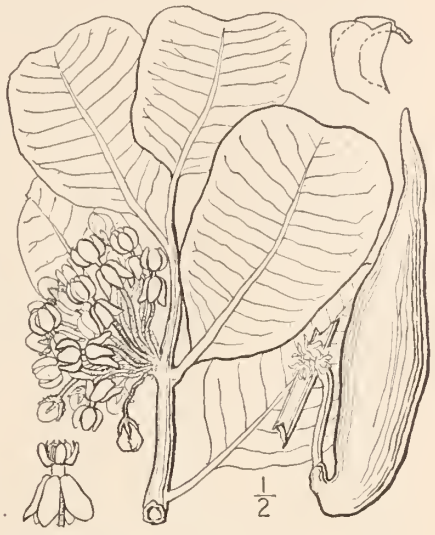
In moist soil, Minnesota to British Columbia, south to Kansas, Utah and California. May–July.

17. Asclepias arenària Torr. Sand Milkweed. (Fig. 2916.)

Asclepias arenaria Torr. Bot. Mex. Bound. Surv. 162. 1859.

Densely tomentose-canescent all over, stems simple, ascending or erect, stout, 1°–2° high. Leaves obovate or oval, wavy-margined, thick, obtuse or retuse and cuspidate at the apex, truncate, subcordate, obtuse, or rarely some of them narrowed at the base, 2′–4′ long, 1½′–3′ wide, the angle of the primary nervation broad; umbels densely many-flowered, short-peduncled or sessile; corolla greenish-white, its segments oval-oblong, 4″–5″ long; column 1″–2″ high; hoods oblong, truncate at each end, oblique at the apex, longer than the anthers, with a broad tooth on each side within; horn semi-lunate with an abruptly incurved subulate apex; follicles puberulent, 4′–5′ long, erect on the decurved fruiting pedicels.

On sand-bars and hills along rivers, Nebraska and Colorado to Mexico and New Mexico. June–Sept.



18. Asclepias ovalifòlia Dec. Oval-leaved Milkwort. (Fig. 2917.)

Asclepias ovalifolia Dec. in DC. Prodr. 8: 567. 1844.

Finely tomentose all over; stem simple, usually slender, erect, 10′–2° high. Leaves oval, ovate, oblong or ovate-lanceolate, acute or obtuse and mucronulate at the apex, rounded or narrowed at the base, 2′–3′ long, ½′–1½′ wide, short-petioled, the upper surfaces becoming glabrate at maturity; umbels solitary or few, many-flowered; peduncles short; corolla greenish-white or purplish, its segments ovate-oblong, obtuse, 2″–3″ long; column very short; hoods oval-oblong, nearly twice as long as the anthers, bearing a large acute tooth on each of the inner margins; horn subulate, incurved over the stigma; follicles ascending on the reflexed fruiting pedicels, pubescent.

In woods and on prairies, Illinois to Minnesota, Manitoba and the Northwest Territory. June–July.

19. Asclepias brachystéphana Engelm. Short-crowned Milkweed. (Fig. 2918.)

Asclepias brachystephana Engelm.; Torr. Bot. Mex. Bound. Surv. 163. 1859.

Puberulent when young, soon glabrate; stems clustered, often branched, spreading or ascending, 6′–12′ long. Leaves mostly opposite, lanceolate or linear-lanceolate, thick, long-acuminate at the apex, rounded, subcordate or narrowed at the base, 2′–5′ long, 2″–6″ wide, or the lowest shorter; petioles 1″–4″ long; umbels several, terminal and axillary, few-flowered; peduncles short; pedicels densely woolly, equalling or longer than the peduncles; corolla greenish-purple, its segments about 2″ long; column very short or none; hoods ovate, obtuse, shorter than the anthers, the short erect-incurved horn slightly exserted; follicles erect on the spreading or decurved fruiting pedicels, downy or hoary, acuminate, 2′–3½′ long.

In dry soil, Kansas (according to B. B. Smyth), Wyoming to Texas, Arizona and Mexico. June–Aug.

20. **Asclepias perénnis** Walt. Thin-leaved Milkweed. (Fig. 2919.)

Asclepias perennis Walt. Fl. Car. 107. 1788.

Puberulent above, glabrous below; stem slender, simple or branched, erect, sometimes slightly woody at the base, 1°–3° high. Leaves thin, opposite, lanceolate, oblong or ovate-lanceolate, slender-petioled, acuminate or acute at both ends, 2′–6′ long, ¼′–1′ wide, glabrous or very nearly so; umbels solitary, or several and corymbose; peduncles 1′–2′ long; pedicels very slender, ½′–1′ long; flowers very small, white; corolla-segments oblong, 1″–2″ long; column about ½″ high; hoods oval, erect, entire, about as long as the anthers, shorter than the subulate-filiform incurved horn; follicles glabrous, erect on the erect fruiting pedicels; seeds 5″–6″ long, 3½″–4½″ wide, very thin, destitute of coma.

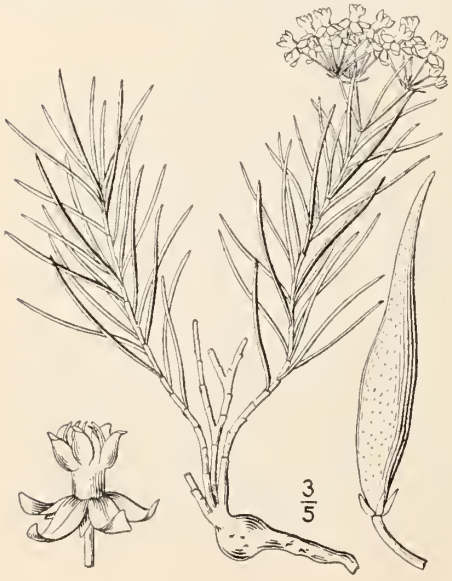
On river-shores and in wet places, North Carolina to southern Illinois and Missouri, south to Florida and Texas. May–Aug.

21. **Asclepias verticillàta** L. Whorled Milkweed. (Fig. 2920.)

Asclepias verticillata L. Sp. Pl. 217. 1753.

Roots fascicled; stem slender, simple or branched, pubescent in lines at least above, very leafy, 1°–2½° high. Leaves narrowly linear, sessile, verticillate in 3's–7's or some of them alternate, glabrous or very nearly so, their margins narrowly revolute; umbels usually numerous, many-flowered; peduncles slender, ½′–1½′ long; pedicels almost filiform, shorter than the peduncles; corolla greenish white, its segments oblong, 1½″–2″ long; column about ½″ high; hoods white, oblong, entire, about equalling the anthers, much shorter than the subulate incurved horn; follicles erect on the erect fruiting pedicels, narrowly spindle-shaped, glabrous, 2′–3′ long.

In dry fields and on hills, Maine and southern Ontario to the Northwest Territory, south to Florida, Mexico and New Mexico. July–Sept.



22. **Asclepias pùmila** (A. Gray) Vail. Low Milkweed. (Fig. 2921.)

Asclepias verticillata var. *pumila* A. Gray, Proc. Am. Acad. 12: 71. 1876.

Stems 4′–10′ high, tufted from a woody root. Leaves very numerous, crowded, sometimes obscurely whorled, filiform-linear, 1′–2′ long, smooth or minutely roughened, the margins revolute; umbels 2-several, short-peduncled, few-flowered; pedicels filiform, puberulent, 3″–4″ long; corolla greenish white, its segments oblong, 1½″–2″ long; column short; hoods white, erect, oblong, entire, equalling the anthers, shorter than the slender incurved horn; follicles erect on erect fruiting pedicels, narrowly spindle-shaped, 1½′–2′ long, finely puberulent.

Dry plains, South Dakota to Arkansas, Colorado and New Mexico.

2. ASCLEPIODÒRA A. Gray, Proc. Am. Acad. 12: 66. 1876.

Erect or decumbent perennial herbs, similar to *Asclepias*, with alternate or opposite entire leaves, and rather large flowers in terminal solitary or corymbed umbels. Sepals lanceolate. Corolla rotate, its segments spreading. Hoods oblong, inserted over the whole of the very short corona-column, curved upward, obtuse, crested within, at least in the upper part, slightly longer than the anther; at the sinuses between the hoods a small lobe or appendage, alternate with the anther-wings, simulating an inner crown. Anthers tipped with a scarious membrane, their wings horny, narrowed below, sometimes angled above the middle. Pollen-masses pendulous, pyriform, longer than their caudicles. Follicles ovoid or oblong, acuminate, with or without soft spinose processes, erect or ascending on the decurved or twice bent fruiting pedicels. Seeds comose. [Greek, gift of AEsculapius.]

Five or six species, natives of the southern United States and Mexico.

Glabrous or nearly so; leaves oblong to ovate-lanceolate; umbels usually more than one, corymbose. 1. *A. viridis.*

Stem rough-puberulent; leaves lanceolate or linear, acuminate; umbels solitary. 2. *A. decumbens.*

1. Asclepiodora víridis (Walt.) A.Gr. Oblong-leaved Milkweed. (Fig. 2922.)

Asclepias viridis Walt. Fl. Car. 107. 1788.
Asclepiodora viridis A. Gray, Proc. Am. Acad. 12: 66. 1876.

Stem erect, glabrous or puberulent above, rather stout, simple, 1°–2° high. Leaves oblong to ovate-lanceolate, rather thin, obtuse and mucronulate or acute at the apex, narrowed or rounded at the base, short-petioled, 2½′–5′ long, ½′–1½′ wide; umbels 2–4, or sometimes solitary; peduncles 1½′–2′ long; pedicels slender, about ½′ long; corolla globose-ovoid in the bud, greenish, its segments, when expanded, oblong, obtuse or acute, 4″–6″ long, 2–3 times as long as the purplish or violet entire-margined hoods; anther-wings narrow, scarcely angled above; fruiting pedicels twice bent; follicles ascending, puberulent, 2′–3′ long, sometimes with soft spinose projections.

In dry soil, Illinois and Kansas to Texas, east to South Carolina and Florida. May–July.

2. Asclepiodora decúmbens (Nutt.) A. Gray. Decumbent Milkweed. (Fig. 2923.)

Ananthrix decumbens Nutt. Trans. Am. Phil. Soc. (II.) 5: 202. 1833–37.
Asclepiodora decumbens A. Gray, Proc. Am. Acad. 12: 66. 1876.

Stems decumbent or ascending, rough-puberulent, rather stout, 10′–2° long. Leaves firm, lanceolate or linear-lanceolate, glabrous above, puberulent, at least on the veins, beneath, acuminate at the apex, narrowed at the base, 3′–7′ long, 2″–8″ wide; umbel solitary, many-flowered; peduncle 1′–5′ long; pedicels rather stout, ½′–1′ long; corolla depressed-globose in the bud, greenish, its segments, when expanded, ovate or broadly oval, somewhat longer than the hoods; hoods purple, obtusely 3-lobed on the ventral margins, about 3″ long, their tips incurved; anther-wings broad, angled above; follicles nearly erect on the recurved fruiting pedicels, 3′–4′ long, puberulent, at least when young, with or without soft projections.

In dry soil, Kansas, to Texas and Mexico, west to Utah and New Mexico. April–June.

3. ACERÀTES Ell. Bot. S. C. & Ga. 1: 316. 1817.

Perennial herbs, similar to *Asclepias*, with alternate or opposite thick leaves, and green or purplish flowers in terminal or axillary and short-peduncled or sessile umbels. Calyx 5-parted or 5-divided, the segments acute, glandular within. Corolla deeply 5-cleft, the segments valvate, reflexed in anthesis. Corona-column very short. Corona of 5 involute-concave or somewhat pitcher-shaped hoods, neither horned nor crested within or in one species having a small interior crest and usually a few small processes at the base of the anther-wings, forming an obscure inner crown. Pollen-masses solitary in each sac, oblong, pendulous. Stigma 5-lobed. [Greek, without horn, referring to the crown.]

About 7 species, natives of North America.

Umbels sessile, or very nearly so, mostly axillary.
- Leaves oval to linear; hoods entire at the apex. — 1. *A. viridiflora.*
- Leaves narrowly linear; hoods 3-toothed. — 2. *A. angustifolia.*

Umbels, at least the lower, distinctly peduncled.
- Plants glabrous, or nearly so; umbels usually several; leaves narrow.
  - Hoods obtuse, entire; column ½″ long; stem roughish puberulent. — 3. *A. Floridana.*
  - Hoods emarginate; column very short; stem glabrous. — 4. *A. auriculata.*
- Plant hirsute; umbel solitary, terminal; leaves ovate to oblong. — 5. *A. lanuginosa.*

1. Acerates viridiflòra (Raf.) Eaton. Green Milkweed. (Fig. 2924.)

Asclepias viridiflora Raf. Med. Rep. (II.) 5: 360. 1808.
Acerates viridiflora Eaton, Man. Ed. 5, 90. 1829.

Puberulent or tomentulose, at least when young; stems simple, reclined or ascending, rather stiff, 1°–3° high. Leaves slightly rough, alternate or opposite, thick, oval, oblong or ovate, 1′–3′ long, ½′–2′ wide, short-petioled, the margins usually undulate; umbels several, or rarely solitary, axillary, densely many-flowered, sessile or very nearly so; pedicels very slender, tomentose, 4″–8″ long; flowers green; corolla-segments narrowly oblong, 2″–3″ long; column very short or none; hoods lanceolate-oblong, obtuse, minutely 2-auricled at the base; mass of anthers longer than thick; anther-wings tapering below, semi-rhomboid above; follicles puberulent, 2′–4′ long.

In dry, sandy or rocky soil, Massachusetts to southern Ontario and the Northwest Territory, south to Florida and Texas. June–Sept.

A. viridiflòra Ívesii Britton, Mem. Torr. Club, 5: 265. 1894.
Asclepias lanceolata Ives, Am. Journ. Sci. 1: 252. 1819. Not Walt. 1788.
Acerates viridiflora var. *lanceolata* A. Gray, Syn. Fl. 2: Part 1, 99. 1878.

Leaves lanceolate or oblong-lanceolate, 2′–5′ long, ¼″–1″ wide. Range of the type, often with it.

Acerates viridiflòra lineàris A. Gray, Syn. Fl. 2: Part. 1, 99. 1878.

Leaves elongated-linear; stem low; umbels often solitary. Minnesota and Manitoba to the Northwest Territory, Louisiana and New Mexico.

2. Acerates angustifòlia (Nutt.) Dec. Narrow-leaved Milkweed. (Fig. 2925.)

Polyotus angustifolius Nutt. Trans. Am. Phil. Soc. (II.) 5: 201. 1833–37.
A. angustifolia Dec. in DC. Prodr. 8: 522. 1844.
Asclepias stenophylla A. Gray, Proc. Am. Acad. 12: 72. 1876.

Stems mostly several together, erect, straight, 1°–2° high, puberulent above, glabrate below. Leaves opposite, or some of the lower alternate, sessile, narrowly linear, 2′–5′ long, glabrous, the revolute margins and the thick midvein rough beneath; umbels 10–15-flowered, short-peduncled or subsessile, axillary, usually numerous; pedicels puberulent; corolla-segments oblong, greenish; hoods white, not exceeding the anthers, 3-toothed at the apex, the acute middle tooth merely a prolongation of the thickened crest-like midvein, shorter than the obtuse lateral ones; anther-wings notched at about the middle; follicles slender, erect, about 3′ long or more.

On dry plains, Nebraska and Colorado to Texas.

3. Acerates Floridàna (Lam.) Hitchc. Florida Milkweed. (Fig. 2926.)

Asclepias Floridana Lam. Encycl. 1: 284. 1783.
Acerates longifolia Ell. Bot. S. C. & Ga. 1: 317. 1817.
Acerates Floridana A. S. Hitchc. Trans. St. Louis Acad. 5: 508. 1891.

Rough-puberulent; stems slender, simple or little branched, erect or ascending, 1°–3° high. Leaves linear or rarely linear-lanceolate, acute or acuminate, short-petioled, 2′–8′ long, 1½″–6″ wide, commonly rough-ciliolate on the margins and midrib; umbels several or solitary, peduncled, usually many-flowered; peduncles 3″–15″ long; pedicels slender, hirsute, ½′–1′ long; corolla greenish white, its segments narrowly oblong, about 2″ long; column short but distinct; hoods oblong, obtuse, entire, shorter than the anthers; anther-wings narrowed to the base; follicles densely puberulent, 4′–5′ long.

In moist soil, Ohio to southern Ontario and Minnesota, south to North Carolina, Florida and Texas. June–Sept.

4. Acerates auriculàta Engelm. Auricled Milkweed. (Fig. 2927.)

Acerates auriculata Engelm. Bot. Mex. Bound. Surv. 160. 1859.
Asclepias auriculata Holzinger, Bot. Gaz. 17: 125. 1892.

Stem glabrous, often glaucous, sinuous above, rarely branched below, usually stout, 1°–3° high. Leaves narrowly linear, glabrous, short-petioled, 3′–8′ long, ½″–2½″ wide, becoming leathery, the rough margins not revolute; umbels commonly several, densely many-flowered, peduncled; peduncels 2″–1′ long, pubescent; pedicels slender, pubescent; flowers greenish white tinged with dull purple; corolla-segments oblong, 2″–2½″ long; column short, but distinct; hoods yellow, often with a purplish keel, entire, or emarginately truncate at the apex, not exceeding the anthers, the involute margins spreading at the base into broad auricles; follicles 2′–3′ long, curved.

In dry soil, Nebraska and Colorado to Texas and New Mexico. June–Sept.

5. Acerates lanuginòsa (Nutt.) Dec. Woolly Milkweed. (Fig. 2928.)

Asclepias lanuginosa Nutt. Gen. 1: 168. 1818.
Acerates lanuginosa Dec. in DC. Prodr. 8: 523. 1844.

Hirsute all over; stems erect, slender, simple, 6′–18′ high. Leaves oblong, ovate-lanceolate or lanceolate, obtuse at the apex, narrowed or rounded at the base, short-petioled, 1′–4′ long, 4″–15″ wide; umbel solitary, terminal, densely many-flowered, peduncled; peduncle stout, densely hirsute, ½′–1½′ long; pedicels slender, puberulent or hirsute; corolla greenish, its segments oblong, about 2½″ long; column none; hoods purplish, oblong, obtuse, entire, with a flat fold or auricle on the infolded lower ventral margins, shorter than the anthers; anther-wings broadest below the middle.

On prairies, northern Illinois to Minnesota and Wyoming. June–Aug.

4. AMPÉLANUS Raf.; Britton, Bull. Torr. Club, 21: 314. 1894.

[Enslenia Nutt. Gen. 1: 164. 1818. Not Raf. 1817.]

Perennial twining herbaceous vines, with petioled opposite cordate thin leaves, and small whitish flowers in axillary peduncled cymes. Calyx 5-parted, minutely glandular within, the segments lanceolate. Corolla campanulate, deeply 5-cleft, the lobes slightly contorted, nearly erect. Crown nearly sessile, of 5 membranous truncate lobes, each appendaged by a simple or 2-cleft awn. Stamens inserted at the base of the corolla, the filaments connate into a short tube; anthers terminated by an inflexed membrane; pollen-masses solitary in each sac, ellipsoid, pendulous. Stigma conic, slightly 2-lobed. Follicles thick, acuminate. Seeds comose. [Greek, vine-like.]

Three species, natives of America.

1. Ampelanus álbidus (Nutt.) Britton. Sand Vine. (Fig. 2929.)

Enslenia albida Nutt. Gen. 1: 164. 1818.
A. albidus Britton, Bull. Torr. Club, 21: 314. 1894.

Stem sparingly puberulent, at least above, high-climbing, slender. Leaves slender-petioled, ovate, gradually acuminate, deeply cordate, palmately veined, glabrous or very nearly so, entire, 3′–7′ long, 1½′–5′ wide; petioles 1′–4′ long; cymes usually numerous, rather densely flowered; peduncles stout, 3″–2′ long; flowers 2″–3″ long; corolla-segments lanceolate, acute, about twice as long as those of the calyx and slightly exceeding the 2-cleft awns of the corona-lobes; follicles erect on the ascending fruiting pedicels, 4′–6′ long, glabrous when mature.

Along river-banks and in thickets, southern Pennsylvania to Illinois and Kansas, south to Florida and Texas. June–Aug.

5. CYNÁNCHUM L. Sp. Pl. 212. 1753.

[Vincetoxicum Moench, Meth. 717. 1794. Not Walt. 1788.]

Perennial twining herbaceous or slightly woody vines (some species erect herbs), with opposite or rarely verticillate or alternate leaves, and small yellowish green or purplish flowers in axillary cymes. Calyx 5-parted, minutely glandular within. Corolla rotate, deeply 5-cleft, the segments spreading, somewhat twisted. Crown cup-like, entire, 5-lobed or 5-parted, the lobes not appendaged. Stamens attached to the base of the corolla, their filaments connate into a tube; anthers appendaged by an inflexed membrane. Pollen-masses solitary in each sac, pendulous. Stigma flat or conic. Follicles acuminate, glabrous. Seeds comose. [Greek, dog-strangling, alluding to its poisonous qualities.]

About 100 species, natives of warm and temperate regions of both the Old World and the New. Besides the following, 2 native species occur in the southeastern United States.

1. Cynanchum nìgrum (L.) Pers. Black Swallow-wort. (Fig. 2930.)

Asclepias nigra L. Sp. Pl. 216. 1753.
Vincetoxicum nigrum Moench, Meth. 317. 1794.
Cynanchum nigrum Pers. Syn. 1: 274. 1805.

Twining, or at first erect, stem slightly puberulent, slender, 2°–5° high. Leaves ovate or ovate-lanceolate, entire, thin, acuminate at the apex, rounded at the base, pinnately veined, petioled, 2′–5′ long, ½′–2½′ wide, glabrous, or puberulent beneath; petioles 2″–12″ long; pedicels 1½″–3″ long; flowers dark purple, about 2½″ broad; crown fleshy, 5-lobed; follicles on nearly straight fruiting pedicels, about 2′ long, glabrous.

In waste places, escaped from gardens, Massachusetts to Pennsylvania and Ohio. Introduced from Europe. June–Sept.

6. VINCETÓXICUM Walt. Fl. Car. 104. 1788.

[Gonolobus Michx. Fl. Bor. Am. 1: 119. 1803.]

Twining or trailing perennial vines, with opposite usually cordate leaves, and rather large purple brown white or greenish flowers in axillary umbel-like cymes or fascicles. Calyx 5-parted or deeply 5-cleft, mostly 5-glandular within. Corolla rotate, very deeply 5-parted, the tube very short, the segments convolute in the bud. Corona (crown) annular or cup-shaped, entire, lobed or divided, adnate to the corolla. Stamens inserted on the base of the corolla, the filaments connate into a tube; anthers not appendaged, merely tipped, borne along or just under the margin of the flat-topped stigma, the sacs more or less transversely dehiscent. Pollen-masses solitary in each sac, horizontal or nearly so. Follicles thick, acuminate, smooth, angled or tuberculate. Seeds comose. [Greek, subduing poison.]

About 75 species, natives of America. Besides the following, some 10 others occur in the southern and southwestern United States.

Crown annular, 10-crenate; follicles angled, not warty.
- Corolla about twice as long as the calyx. — 1. *V. suberosum.*
- Corolla 3–4 times as long as the calyx. — 2. *V. gonocarpos.*

Crown cup-shaped, about as high as the anthers; follicles warty.
- Flowers purple to dull yellow.
  - Corolla-segments oblong, 3″–4″ long. — 3. *V. hirsutum.*
  - Corolla-segments linear or linear-oblong, 5″–7″ long.
    - Crown merely crenate. — 4. *V. obliquum.*
    - Crown toothed or lobed.
      - Crown 5-lobed, with a subulate 2-cleft tooth in each sinus. — 5. *V. Carolinense.*
      - Crown 10-toothed, the alternate teeth thinner and longer. — 6. *V. Shortii.*
- Flowers white. — 7. *V. Baldwinianum.*

1. Vincetoxicum suberòsum (L.) Britton. Coast Vincetoxicum. (Fig. 2931.)

Cynanchum suberosum L. Sp. Pl. 212. 1753.
G. suberosus R. Br. in Ait. Hort. Kew. Ed. 2: 82. 1811.
V. suberosum Britton, Mem. Torr. Club, 5: 266. 1894.

Stem pubescent or glabrous, slender, twining. Leaves thin, 2′–5′ long, 1′–3′ wide, ovate or ovate-oval, acute or abruptly acuminate at the apex, cordate at the base, the sinus shallow, open; petioles ½′–2′ long; cymes commonly few-flowered; peduncles ¼′–1′ long; pedicels ½′–1′ long, fleshy, nearly glabrous; corolla brown-purple, broadly conic in the bud, its segments lanceolate or ovate-lanceolate, acute, pubescent or granulose within, 3″–4″ long, about twice as long as the calyx; crown an annular fleshy undulately 10-crenate disk; follicles glabrous, 3–5-angled, when young fleshy, when mature dry and spongy, 4′–6′ long, 1′ in diameter or more.

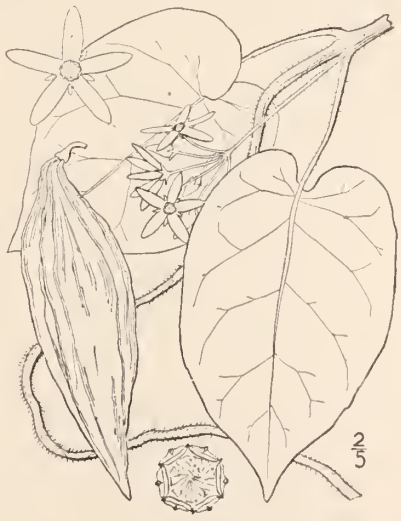
In thickets, Virginia to Florida, mainly near the coast. May–July.

2. Vincetoxicum gonocàrpos Walt. Large-leaved Angle-pod. (Fig. 2932.)

Vincetoxicum gonocarpos Walt. Fl. Car. 104. 1788.
G. macrophyllus Michx. Fl. Bor. Am. 1: 119. 1803.
Gonolobus laevis var. *macrophyllus* A. Gray, Syn. Fl. 2: Part 1, 103. 1878.

Glabrous or pubescent, stems slender, climbing high. Leaves broadly ovate, thin, 3′–8′ long, 2′–6′ wide, acuminate at the apex, deeply cordate at the base, the sinus narrow or the rounded auricles overlapping; petioles 1′–4′ long; cymes few-flowered; peduncles 1′–3′ long; pedicels rather stout, glabrous or nearly so; corolla conic in the bud, its segments lanceolate, 4‴–5‴ long, 3–4 times as long as the calyx; crown a low obtusely undulate disk; follicles glabrous, similar to those of the preceding species but usually shorter.

Along rivers and in moist thickets, Virginia to South Carolina, west to Indiana, Missouri and Texas.



Vincetoxicum gonocàrpos laèvis (Michx.) Britton, Mem. Torr. Bot. Club, 5: 266. 1894.
Gonolobus laevis Michx. Fl. Bor. Am. 1: 119. 1803.
Usually glabrous; sinus of the leaves open. Near Washington, D. C., Kansas (according to B. B. Smyth), south to Mississippi and Texas.

3. Vincetoxicum hirsùtum (Michx.) Britton. Hairy Vincetoxicum. (Fig. 2933.)

Gonolobus hirsutus Michx. Fl. Bor. Am. 1: 119. 1803.
V. hirsutum Britton, Mem. Torr. Club, 5: 266. 1894.

Stem downy, slender. Leaves ovate, acuminate at the apex, deeply cordate at the base, downy, 2′–4′ long, 1′–2½′ wide, the sinus narrow, or the lobes sometimes overlapping; petioles slender, pubescent, ½′–2′ long; peduncles usually about equalling the petioles, sometimes longer; umbels few–several-flowered; corolla brown-purple to greenish yellow, ovoid in the bud, its segments oblong, very obtuse, 3″–4″ long, minutely puberulent without, about 4 times as long as the deusely pubescent calyx; crown cup-shaped, fleshy, about as high as the anthers, the margin 10-crenate; follicles lanceolate, 3′–5′ long, muricate, puberulent; seeds entire.

In thickets, Maryland to Florida, west to Tennessee. July–Aug.

4. Vincetoxicum oblìquum (Jacq.) Britton. Large-flowered Vincetoxicum. (Fig. 2934.)

Cynanchum hirtum L. Sp. Pl. 212. 1753?
Cynanchum obliquum Jacq. Coll. 1: 148. 1786.
G. obliquus R. Br.; R. & S. Syst. 4: 64. 1820.
V. obliquum Britton, Mem. Torr. Club, 5: 266. 1894.

Stem puberulent or hirsute, slender. Leaves pubescent, broadly ovate, acuminate at the apex, deeply cordate at the base with an open or closed sinus, 2′–8′ long, 1½′–6′ wide; petioles rather stout, pubescent, 1′–4′ long; umbels slender-peduncled, few-flowered; pedicels very slender, 1′–2′ long; corolla narrowly conic in the bud, red-purple within, greenish and minutely pubescent without, its segments elongated-linear, obtuse, 6–7 times as long as the hirsute calyx; crown cup-shaped, as high as the anthers, fleshy, its margin 10-crenulate, the intermediate crenulations sometimes 2-dentate; follicles ovoid-lanceolate, 2′–3′ long, muricate.

In thickets, Pennsylvania to Ohio, south to Virginia and Kentucky. July–Aug.

5. Vincetoxicum Carolinénse (Jacq.) Britton. Carolina Vincetoxicum. (Fig. 2935.)

Cynanchum Carolinense Jacq. Coll. 2: 228. 1788.
G. Carolinensis R. Br.; R. & S. Syst. 6: 62. 1820.
V. Carolinense Britton, Mem. Torr. Club, 5: 265. 1894.

Stem hirsute. Leaves broadly ovate, acute or short-acuminate at the apex, deeply cordate at the base with a narrow or closed sinus, 3′–7′ long, 2′–5½′ wide, pubescent, at least beneath; petioles hirsute, 1½′–4′ long; peduncles 2′–4′ long; pedicels very slender, 1′ long or more; corolla brown-purple, oblong-conic in the bud, puberulent without, its segments linear-oblong or linear-lanceolate, obtusish, 5″–6″ long, 5–6 times longer than the hirsute calyx; crown cup-shaped, scarcely fleshy, 5-lobed, with a subulate longer 2-cleft erect tooth in each sinus; follicles muricate.

In thickets, Virginia to Missouri, south to South Carolina and Louisiana. May–July.

6. Vincetoxicum Shórtii (A. Gray) Britton. Short's Vincetoxicum. (Fig. 2936.)

Gonolobus obliquus var. *Shortii* A. Gray, Syn. Fl. 2: Part 1, 104. 1878.
G. Shortii A. Gray, loc. cit. Ed. 2, 404. 1886.
V. Shortii Britton, Mem. Torr. Club, 5: 266. 1894.

Stem pubescent, or hirsute with spreading hairs. Leaves downy, broadly ovate, acute or short-acuminate at the apex, deeply cordate at the base and when old with a narrow or closed sinus, 4′–7′ long, 1½′–5½′ wide; petioles stout, pubescent, 1½′–3′ long; peduncles usually longer than the petioles; cymes several-flowered; pedicels 1′ long or more; corolla oblong-conic in the bud, dark crimson-purple, its lobes linear, 5″–7″ long, 5–7 times as long as the hirsute calyx; crown cup-shaped, fleshy, as high as the anthers, its margin about 10-toothed, the alternate teeth thinner and longer, emarginate or 2-parted, the others broader, thicker, with an obscure internal crest or ridge below the summit; follicles warty.

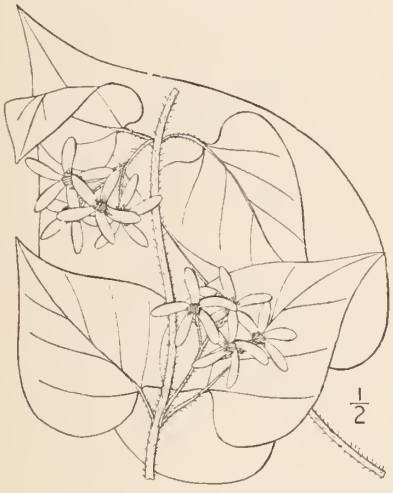
In thickets, Pennsylvania to eastern Kentucky and Georgia. Flowers with the odor of the Strawberry-shrub. June–Aug.

7. Vincetoxicum Baldwiniànum (Sweet) Britton. Baldwin's Vincetoxicum. (Fig. 2937.)

Gonolobus Baldwinianus Sweet; A. Gray, Syn. Fl. 2: Part 1, 104. 1876.
Vincetoxicum Baldwinianum Britton, Mem. Torr. Club, 5: 265. 1894.

Stem pubescent, or hirsute. Leaves downy, broadly ovate, acute, or short-acuminate at the apex, deeply cordate at the base, 3′–6′ long, or more; petioles hirsute, 1′–2′ long; peduncles 6″–12″ long, usually longer than the pedicels; cymes several-many-flowered; corolla white, or cream-color, the lobes thin, oblong, or becoming spatulate, 4″–5″ long; crown thin, the 5 broader lobes quadrate, emarginate, or obscurely toothed; in their sinuses a pair of very slender linear-subulate teeth of more than double their length, much surpassing the stigma.

Missouri and Arkansas to Georgia. May–June.



Family 19. CONVOLVULÀCEAE Vent. Tabl. 2: 394. 1799.

MORNING-GLORY FAMILY.

Herbs, some tropical species shrubs or trees, the stems twining, ascending, trailing or erect, with alternate exstipulate entire dentate lobed or dissected leaves, and regular perfect axillary cymose or solitary flowers. Calyx inferior, 5-parted or 5-divided, usually persistent, the segments or sepals imbricated. Corolla gamopetalous, funnelform, salverform, campanulate, tubular or rarely subrotate, the limb 5-angled, 5-lobed or entire. Stamens 5, inserted low down on the tube of the corolla and alternate with its lobes, all anther-bearing, the filaments filiform, or dilated at the base, equal or unequal; anthers 2-celled, the sacs longitudinally dehiscent. Disk annular or none. Ovary superior, sessile, 2–3-celled, with 2 ovules in each cavity, or falsely 4–6-celled with a single ovule in each cavity, entire or 2–4-divided; styles 1–3, terminal, or arising from between the ovary-divisions; ovules anatropous. Fruit a 2–4-valved capsule or of 2–4 distinct carpels, in our species. Seeds erect, the testa villous, pubescent or glabrous; embryo plaited or crumpled; cotyledons foliaceous; endosperm fleshy or cartilaginous, usually scanty.

About 40 genera and 900 species, of wide geographic distribution, most abundant in the tropics.

Ovary 2-divided, the carpels 2-ovuled; creeping herbs. 1. *Dichondra.*
Ovary entire, 2-4-celled; style simple, cleft or divided.
Style 2-cleft or 2-divided.
Style 2-cleft or 2-parted.
Style 2-divided to the ovary, each division 2-cleft. 2. *Breweria.* 3. *Evolvulus.*
Style entire up to the stigma.
Stigma or stigmas capitate or globose.
Corolla salverform; stamens and style exserted. 4. *Quamoclit.*
Corolla funnelform or campanulate; stamens and style included. 5. *Ipomoea.*
Stigmas 2, filiform to oblong. 6. *Convolvulus.*

1. DICHÓNDRA Forst. Char. Gen. Pl. 39. *pl. 20.* 1776.

Prostrate or creeping slender annual (sometimes perennial?) silky-pubescent or glabrous herbs, with nearly orbicular cordate or reniform petioled entire leaves, and very small solitary axillary pedunculed flowers. Sepals nearly equal, oblong or spatulate. Corolla open-campanulate, deeply 5-lobed, the lobes induplicate in the bud. Stamens shorter than the corolla; filaments filiform. Ovary villous, deeply 2-parted, each lobe 2-celled; styles 2, simple, arising from the bases of the ovary-lobes; stigmas capitate. Fruit of 2 pubescent 2-valved or indehiscent 1–2-seeded capsules. [Greek, two-grained, referring to the capsules.]

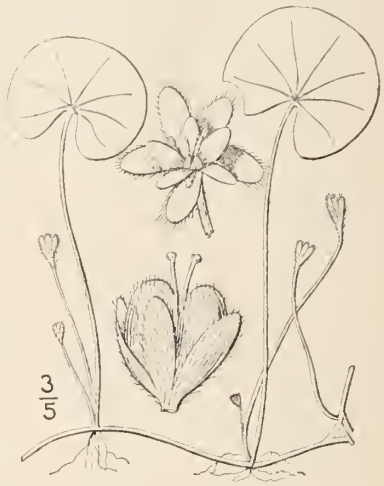
About 5 species, natives of warm and tropical regions. Besides the following, another occurs in the southwest.

1. Dichondra evolvulàcea (L. f.) Britton. Dichondra. (Fig. 2938.)

Sibthorpia evolvulacea L. Suppl. 288. 1781.
Dichondra repens Forst. Fl. Inst. Aust. Prodr. 2. 1786.
D. evolvulacea Britton, Mem. Torr. Club, 5: 268. 1849.

Somewhat pubescent, or glabrous; stems almost filiform, creeping, rooting at the nodes, 6′–2° long. Leaves orbicular to reniform, deeply cordate, ¼′–1½′ in diameter, palmately veined; petiole often much longer than the blade; flowers 1″–2″ broad; peduncles filiform; sepals obtuse, spatulate or obovate; corolla yellow to white, shorter than the sepals, its lobes ovate to oblong; capsule 1″ high or less.

In moist or wet places, Virginia to Texas and Mexico, near the coast. Widely distributed in South America and in the Old World, especially in the southern hemisphere.



2. BREWÈRIA R. Br. Prodr. Fl. Nov. Holl. 1: 487. 1810.

Herbs, mostly perennial and procumbent, with entire short-petioled or sessile leaves, and 1–5-flowered axillary pedunculs; flowers white, purple, pink, or yellow. Sepals acute or obtuse. Corolla campanulate or funnelform-campanulate; limb plaited, 5-angled or slightly 5-lobed. Stamens included; filaments filiform, or dilated at the base. Ovary 2-celled; style 2-cleft or 2-parted; stigmas capitate. Capsule globose to ovoid, 2-celled, 2–4-valved. Seeds 1–4, glabrous or pubescent. [Named for Samuel Brewer, a correspondent of Dillen.]

About 30 species, widely distributed in warm-temperate and tropical regions. Besides the following, 2 or 3 others occur in Florida and 1 in Texas.

Sepals acute or acuminate; leaves oblong, elliptic or linear.
Corolla white; filaments pubescent; plant pubescent or puberulent. 1. *B. humistrata.*
Corolla purple; filaments glabrous; plant silky-tomentose. 2. *B. aquatica.*
Sepals obtuse; leaves narrowly linear. 3. *B. Pickeringii.*

1. Breweria humistràta (Walt.) A. Gray. Southern Breweria. (Fig. 2939.)

Convolvulus humistratus Walt. Fl. Car. 94. 1788.
Stylisma humistrata Chapm. Fl. S. States, 346. 1860.
Bonamia humistrata A. Gray, Man. Ed. 5, 376. 1867.
Breweria humistrata A. Gray, Syn. Fl. 2: Part 1, 217. 1878.

Pubescent or puberulent; stems slender, 1°–2° long, simple, or with a few long branches. Leaves elliptic, oblong-elliptic, or ovate-oblong, obtuse and mucronulate or some of them emarginate at the apex, subcordate, rounded or narrowed at the base, ½′–1′ wide, 1′–2′ long; petioles 1″–3″ long; peduncles slender, longer than the leaves, 1–7-flowered, minutely bracted at the summit; sepals glabrous or puberulent, oblong, acuminate, 2″–3″ long; corolla white, 6″–8″ long; filaments pubescent; style 2-cleft; capsule ovoid, acute, glabrous, about as long as the calyx.

In dry pine barrens, Virginia to Florida and Louisiana. May–Aug.

2. Breweria aquática (Walt.) A. Gray. Water Breweria. (Fig. 2940.)

Convolvulus aquaticus Walt. Fl. Car. 94. 1788.
Stylisma aquatica Chapm. Fl. S. States, 346. 1860.
Bonamia aquatica A. Gray, Man. Ed. 5, 376. 1867.
Breweria aquatica A. Gray, Syn. Fl. 2: Part 1, 217. 1878.

Finely and densely silky-tomentose, branched, the branches long and slender. Leaves oblong, elliptic, or oblong-lanceolate, obtuse at both ends, mucronate or emarginate at the apex, sometimes subcordate at the base, ½′–1½′ long, 2″–8″ wide; peduncles 1–3-flowered, longer than the leaves, minutely bracted at the summit; sepals densely tomentose, oblong, acute or acuminate, about 2″ long; corolla purple or pink, 5″–7″ long; filaments glabrous; style 2-parted nearly to the base.

In wet soil, especially in pine barrens, Missouri to Texas, east to North Carolina and Florida. May–Aug.

3. Breweria Pickeríngii (M. A. Curtis) A. Gray. Pickering's Breweria. (Fig. 2941.)

Convolvulus Pickeringii M. A. Curtis, Bost. Journ. Nat. Hist. 1: 129. 1837.
Stylisma Pickeringii A. Gray, Man. Ed. 2. 335. 1856.
Bonamia Pickeringii A. Gray, Man. Ed. 5, 376. 1867.
Breweria Pickeringii A. Gray, Syn. Fl. 2. Part 1, 217. 1878.

Stem pubescent or puberulent, very slender, simple or branched, 1°–2° long. Leaves puberulent or glabrous, narrowly linear, obtuse or acutish at the apex, narrowed at the base, 1′–2½′ long, ½″–2″ wide; petioles very short; peduncles slender, about as long as the leaves, with 1 or 2 linear bracts at the summit which are usually longer than the pedicels and calyx; sepals pubescent or hirsute, ovate to oval, obtuse, about 2″ long; corolla white, about 1′ long; filaments nearly glabrous; style 2-cleft; capsule ovoid, acute, pubescent, longer than the calyx.

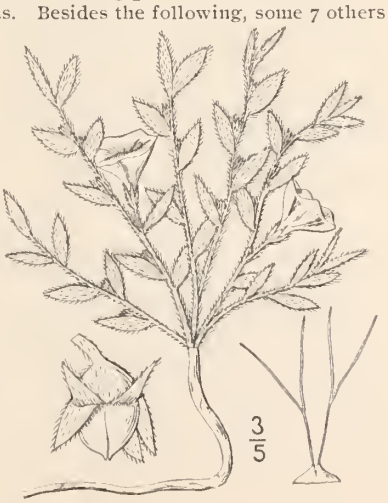
In dry pine barrens, New Jersey to North Carolina; Illinois to Louisiana and Texas. June–Aug.

3. EVÓLVULUS L. Sp. Pl. Ed. 2, 391. 1762.

Erect or diffuse branching, mostly silky-pubescent or pilose, annual or perennial herbs, with small usually entire leaves, and solitary axillary racemose or paniculate small blue pink or white flowers. Sepals nearly equal, acute or obtuse. Corolla funnelform, campanulate or rotate, the limb plaited, 5-angled or 5-lobed. Stamens included, or exserted; filaments filiform; anthers ovate or oblong. Ovary entire, 2-celled; style 2-divided to the base, or near it, each division deeply 2-cleft; stigmas linear-filiform. Capsule globose to ovoid, 2–4-valved, 1–4-seeded. Seeds glabrous. [Latin, unrolling.]

About 85 species, natives of warm and tropical regions. Besides the following, some 7 others occur in the southern United States.

1. Evolvulus pilòsus Nutt. Evolvulus. (Fig. 2942.)



Evolvulus argenteus Pursh, Fl. Am. Sept. 187. 1814. Not R. Br. 1810.
Evolvulus pilosus Nutt. Gen. 1: 174. 1818.

Perennial, densely silky-pubescent or villous; stems ascending or erect, 3′–9′ high, very leafy. Leaves sessile, oblong, lanceolate or spatulate, 3″–9″ long, 1″–3″ wide, acute or obtuse at the apex, narrowed at the base; flowers solitary in the axils; peduncles 2-bracted at the base, recurved in fruit, 1″–2″ long; sepals lanceolate, acute or acuminate; corolla funnelform-campanulate, purple or blue, 3″–6″ broad; capsule 1½″–2″ in diameter, about as long as the sepals.

On dry plains, Nebraska to Mexico and Arizona. May-July.

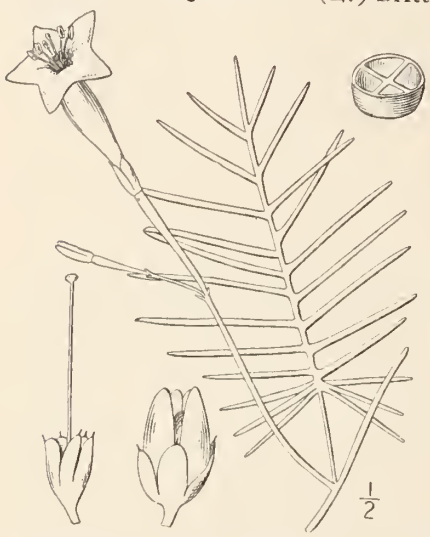
4. QUÁMOCLIT Moench, Meth. 453. 1794.

Twining herbaceous vines, with petioled entire lobed or pinnately parted leaves, and cymose racemose or solitary peduncled axillary flowers. Sepals 5, herbaceous, equal, acuminate, mucronate or appendaged. Corolla salverform (scarlet in the following species), the tube narrow, somewhat dilated above, shorter than the spreading 5-lobed limb. Stamens and style more or less exserted; stigma capitate; ovary 2-celled or falsely 4-celled, 4-ovuled. Fruit usually 4-celled and 4-seeded. [Greek, dwarf kidney-bean.]

About 10 species, of warm and tropical regions, only the following in North America.

Leaves pinnately parted into very narrow segments. 1. *Q. Quamoclit.*
Leaves cordate, acuminate, entire or angulate-lobed. 2. *Q. coccinea.*

1. Quamoclit Quámoclit (L.) Britton. Cypress Vine. Indian Pink. (Fig. 2943.)



Ipomoea Quamoclit L. Sp. Pl. 159. 1753.
Q. vulgaris Choisy in DC. Prodr. 9: 336. 1845.

Annual, glabrous; stem slender, twining to a height of 10°–20°. Leaves ovate in outline, petioled, or nearly sessile, 2′–7′ long, pinnately parted nearly to the midvein into narrowly linear entire segments less than 1″ wide; peduncles slender, commonly much longer than the leaves, 1–6 flowered; pedicels 1′ long or more, thickening in fruit; sepals oblong, obtuse, usually mucronulate, 2″–3″ long; corolla scarlet, salverform, 1′–1½′ long, the tube expanded above, the limb nearly flat, the lobes ovate, acutish; stamens and style exserted; ovary 4-celled; ovule 1 in each cell; capsule ovoid, 4-valved, about 5″ high, twice as long as the sepals.

In waste and cultivated ground, Virginia to Florida, Kansas and Texas. Sparingly escaped from gardens farther north. Naturalized from tropical America. July–Oct. Called also American Red Bell-flower and Sweet William of the Barbadoes.

2. Quamoclit coccínea (L.) Moench. Small Red Morning-glory. (Fig. 2944.)

Ipomoea coccinea L. Sp. Pl. 160. 1753.
Quamoclit coccinea Moench, Meth. 453. 1794.

Annual, glabrous, or puberulent, stem twining to a height of several feet or trailing. Leaves ovate to orbicular, deeply cordate, long-acuminate, 2′–6′ long, entire or angulate-lobed, slender-petioled; peduncles few–several-flowered, usually not longer than the leaves; sepals oblong, obtuse, about 2″ long, subulate-appendaged; corolla salver-form, 10″–20″ long, the limb obscurely 5-lobed; stamens and style slightly exserted; ovary 4-celled with 1 ovule in each cell; capsule globose, 4-valved, 3″–4″ in diameter.

Along river-banks and in waste places, southern Pennsylvania to Florida, west to Ohio, Missouri, Texas and Arizona. Naturalized from tropical America, or native in the Southwest. A hybrid of this species with the preceding is sometimes cultivated. July–Oct.

5. IPOMOÈA L. Sp. Pl. 159. 1753.

Twining trailing ascending or rarely erect herbs, annual or perennial, with large showy axillary solitary or cymose flowers. Sepals equal or unequal. Corolla funnelform or campanulate, the limb entire, 5-angled or 5-lobed, the tube more or less plaited. Stamens equal or unequal, included; filaments filiform, or dilated at the base; anthers ovate, oblong, or linear. Ovary entire, globose or ovoid, 2–4-celled, 4–6-ovuled; style filiform, included; stigmas 1 or 2, capitate or globose. Capsule globose or ovoid, usually septifragally 2–4-valved, 2–4-seeded. [Greek, worm-like.]

About 350 species, of wide geographic distribution. Besides the following, some 25 others occur in southern and western North America. Known as Morning-Glory or False Bindweed.

Ovary 2-celled (rarely 4-celled); stigma entire or 2-lobed.
- Leaves cordate; stems trailing or twining.
  - Perennial from an enormous root; corolla 2′–3′ long. 1. *I. pandurata.*
  - Annual; roots fibrous; corolla 4″–6″ long, white. 2. *I. lacunosa.*
  - Annual; corolla 1′–1½′ long, pink or purple. 3. *I. Carolina.*
- Leaves linear; stems ascending or erect. 4. *I. leptophylla.*

Ovary 3-celled; stigmas 3; leaves cordate.
- Leaves entire; corolla 2′–2½′ long. 5. *I. purpurea.*
- Leaves deeply 3-lobed, corolla 1′–1½′ long. 6. *I. hederacea.*

1. Ipomoea pandurà̀ta (L.) Meyer. Wild Potato Vine. (Fig. 2945.)

Convolvulus panduratus L. Sp. Pl. 153. 1753.
I. pandurata Meyer, Prim. Fl. Esseq. 100. 1818.

Perennial from an enormous fleshy root, glabrous or puberulent; stems trailing or feebly climbing, 2°–12° long. Leaves broadly ovate, cordate, acuminate at the apex, 2′–6′ long, slender-petioled, entire, sometimes contracted in the middle, or some of the later ones rarely angulate-dentate or 3-lobed; peduncles 1–5-flowered, much elongated in fruit; sepals oblong, obtuse or acutish, 6″–8″ long, glabrous; corolla funnelform, white, or with pinkish purple stripes in the throat, 2′–3′ long, the limb 5-lobed; ovary 2-celled; capsule ovoid, 2-valved, 2–4-seeded, the seeds densely woolly on the margins and pubescent on the sides.

In dry soil, in fields or on hills, Ontario to Connecticut and Florida, Michigan, Kansas and Texas. Occurs rarely with double flowers. Called also Man-of-the-Earth and Mecha-Meck (Indian). May–Sept.

2. Ipomoea lacunòsa L. Small-flowered White Morning-glory. (Fig. 2946.)

Ipomoea lacunosa L. Sp. Pl. 161. 1753.

Annual, pubescent or hirsute, rarely glabrous; stem twining, 2°–10° long. Leaves slender-petioled, broadly ovate, cordate, acute or acuminate at the apex, entire, angled or 3-lobed, 2′–4′ long, the lobes acute; peduncles 1–3-flowered, shorter than the leaves; pedicels slender; sepals oblong or lanceolate, acute or acuminate, pubescent or ciliate, about 5″ long; corolla funnelform, 6″–10″ long, white, or the limb purple; ovary 2-celled; stigma capitate; capsule globose, 2-valved, shorter than or about equalling the sepals.

In moist soil, Pennsylvania to South Carolina, west to Illinois, Missouri and Texas. July–Sept.

3. Ipomoea Carolìna (L.) Pursh. Small-flowered Pink Morning-glory. (Fig. 2947.)

Convolvulus Carolinus L. Sp. Pl. 154. 1753.
Ipomoea trichocarpa Ell. Bot. S. C. & Ga. 1: 258. 1817.
Ipomoea commutata R. & S. Syst. 4: 228. 1819.
Ipomoea Carolina Pursh, Fl. Am. Sept. 145. 1814.

Similar in habit to the preceding species, but the leaves usually more lobed; peduncles often longer than the leaves, 1–3-flowered; sepals lanceolate or oblong-lanceolate, acuminate, pubescent or ciliate; corolla 1′–1½′ long, pink or purple; capsule glabrous or pubescent.

Kansas (according to Holzinger) to Texas, east to South Carolina and Florida.

4. Ipomoea leptophýlla Torr. Bush Morning-glory. (Fig. 2948.)

Ipomoea leptophylla Torr. in Frem. Rep. 95. 1845.

Perennial from an enormous root, which sometimes weighs 25 lbs., glabrous throughout; stems erect, ascending or reclining, rather stout, 2°–4° long, much branched. Leaves narrowly linear, entire, acute, 2′–5′ long, 1″–3″ wide; petioles very short; peduncles stout, nearly erect, usually shorter than the leaves, 1–4-flowered; pedicels shorter than the peduncles; sepals broadly ovate, obtuse, 3″–4″ long, or the outer shorter; corolla funnelform, purple or pink, about 3′ long, the limb scarcely lobed; capsule ovoid, acute, 8″–12″ long, 2-celled, much longer than the sepals; seeds pubescent.

In dry soil, Nebraska and Wyoming, south to Texas and New Mexico. May–July.

5. Ipomoea purpùrea (L.) Roth. Morning-glory. (Fig. 2949.)

Convolvulus purpureus L. Sp. Pl. Ed. 2, 219. 1762.
Ipomoea purpurea Roth, Bot. Abh. 27. 1787.

Annual, pubescent; stem retrorsely hairy, twining or trailing, 4°–10° long. Leaves broadly ovate, deeply cordate, acute or acuminate, 2′–4′ wide, slender-petioled; peduncles slender, 1–5-flowered, often longer than the petioles; sepals lanceolate or oblong, acute, pubescent or hirsute near the base, 6″–8″ long; corolla funnelform, blue, purple, pink, variegated or white, 2′–2½′ long; ovary 3-celled (rarely 2-celled); stigmas 3 (rarely 2); capsule depressed-globose, about 5″ in diameter, shorter than the sepals.

In waste places, commonly escaped from gardens, Nova Scotia to Florida, west to Ontario, Nebraska and Texas. There is a double-flowered form in cultivation. Adventive or naturalized from tropical America. July–Oct.

6. Ipomoea hederàcea Jacq. Ivy-leaved Morning-glory. (Fig. 2950.)

Ipomoea hederacea Jacq. Icon. Rar. *pl. 36.* 1781.

Annual, pubescent; stem twining or climbing to a height of 2°–5°, slender, retrorsely hairy. Leaves ovate-orbicular in outline, long-petioled, deeply 3-lobed, cordate at the base, 2′–5′ long, the lobes ovate, acuminate, entire, or the lateral ones sometimes repand or dentate; peduncles 1–3-flowered, much shorter than the petioles; flowers opening in early morning, soon closing; sepals lanceolate with long linear often recurved tips, densely hirsute below, sparingly so above, 8″–12″ long; corolla funnelform, the tube usually nearly white, the limb light blue or purple, 1′–1½′ long; ovary 3-celled; stigmas 3; capsule depressed-globose, 3-valved, about as long as the lanceolate portion of the sepals.

In fields and waste places, Long Island to Florida, west to Pennsylvania, Nebraska and Mexico. Naturalized or adventive from tropical America. July–Oct.

6. CONVÓLVULUS L. Sp. Pl. 153. 1753.

Herbs (the following species perennials with slender rootstocks) with trailing, twining or erect stems. Leaves entire dentate or lobed, mostly cordate or sagittate and petioled. Flowers axillary, solitary or clustered, large, pink, purple or white. Sepals nearly equal or the outer larger, the calyx bractless or with a pair of bracts at its base. Corolla funnelform or campanulate, the limb plaited, 5-angled, 5-lobed, or entire. Stamens inserted on the tube of the corolla, included; filaments filiform, or dilated at the base. Ovary 1–2-celled, 4-ovuled; style filiform; stigmas 2, filiform, oblong, or ovoid. Capsule globose or nearly so, 1–4-celled, 2–4-valved. Seeds glabrous. [Latin, to roll together, or entwine.]

About 175 species, of wide distribution in tropical and temperate regions. Besides the following, some 10 others occur in the southern and western United States.

Calyx with 2 large bracts at the base, which enclose it. (Genus VOLVULUS Medic.)
- Stems trailing or climbing.
  - Stems 3°–10° long; leaves hastate, the auricles often dentate. 1. *C. sepium.*
  - Stems 1°–3° long; leaves sagittate, the auricles rounded, entire. 2. *C. repens.*
- Stem erect or ascending; flowers white; bracts not cordate. 3. *C. spithamaeus.*

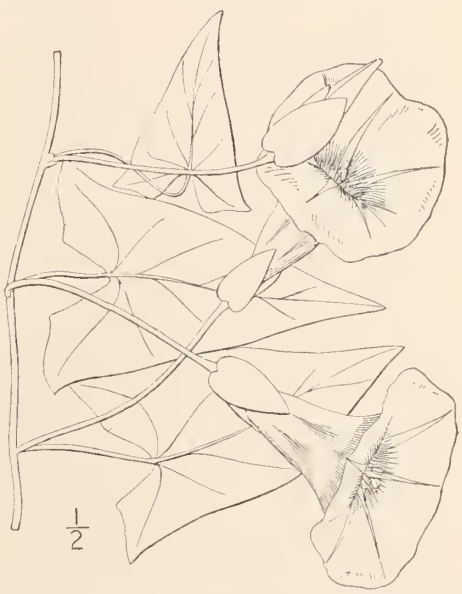
Calyx not bracted; peduncle bracted at the summit.
- Glabrous or nearly so; leaves entire, auriculate. 4. *C. arvensis.*
- Canescent; leaves with 2–4 basal lobes. 5. *C. incanus.*

1. Convolvulus sèpium L. Hedge or Great Bindweed. Rutland Beauty. (Fig. 2951.)

Convolvulus sepium L. Sp. Pl. 153. 1753.
Convolvulus sepium var. *Americanus* Sims, Bot. Mag. *pl. 732.* 1804.
Calystegia sepium R. Br. Prodr. Fl. Nov. Holl. 1: 483. 1810.

Glabrous or pubescent; stems extensively trailing or twining, 3°–10° long. Leaves slender-petioled, triangular in outline, hastate, 2′–5′ long, acute or acuminate at the apex, the basal lobes divergent, usually acute, angulate dentate or entire; petioles ½′–2′ long; peduncles 1-flowered, longer than the leaves; flowers pink with white stripes or white throughout, about 2′ long; bracts at the base of the corolla, large, ovate, acute or obtuse, cordate; stigmas oblong.

In fields and thickets, usually in moist soil, Nova Scotia to North Carolina, west to Minnesota, Utah and Nebraska. Also in Europe and Asia. The plants of eastern North America perhaps constitute several species. June–Aug. Old names, Bell-bind, Woodbind, Lily-bind, Lady's Nightcap and Hedge Lily.



Convolvulus Japónicus Thunb. Fl. Jap. 85, 1784, a species with narrow hastate leaves and smaller pink flowers, cultivated in a double-flowered form, has in this form escaped from cultivation from southeastern New York to the District of Columbia and Missouri.

2. Convolvulus rèpens L. Trailing Bindweed. (Fig. 2952.)

Convolvulus repens L. Sp. Pl. 153. 1753.
Calystegia sepium var. *pubescens* A. Gray, Man. Ed. 5, 376. 1867.
Convolvulus sepium var. *repens* A. Gray, Syn. Fl. 2: Part 1, 215. 1878.

Pubescent or tomentose; stem trailing or twining, 1°–3° long, simple, or sparingly branched. Leaves ovate or oblong, petioled, 1′–2′ long, obtuse, acute or abruptly acuminate at the apex, sagittate or cordate at the base, entire, the basal lobes rounded, scarcely or not at all divergent; petioles ½′–1′ long; peduncles 1-flowered, equalling or longer than the leaves; flowers white (sometimes pink?) about 2′ long; calyx enclosed by 2 ovate acute or obtusish slightly cordate bracts; stigmas oblong.

In dry fields, Virginia to Florida, west to Dakota and Texas. May–Aug.

3. Convolvulus spithamaèus L. Upright Bindweed. (Fig. 2953.)

Convolvulus spithamaeus L. Sp. Pl. 158. 1753.
Calystegia spithamaea Pursh, Fl. Am. Sept. 143. 1814.
Volvulus spithamaeus Kuntze, Rev. Gen. Pl. 447. 1891.

Pubescent, or glabrate; stem erect or ascending, straight, or the summit sometimes feebly twining, 6′–12′ high. Leaves oval, short-petioled or the uppermost sessile, usually obtuse at both ends, sometimes acutish at the apex and subcordate at the base, 1′–2′ long, ½′–1¼′ wide; peduncles 1-flowered, longer than the leaves; flowers white, nearly 2′ long; calyx enclosed by 2 large oval acutish bracts which are narrowed at both ends and not cordate at the base; stigmas oblong, thick.

In dry sandy or rocky fields or on banks, Nova Scotia to the Northwest Territory, south to Florida. Ascends to 3500 ft. in Virginia. May–Aug.

4. Convolvulus arvénsis L. Small Bindweed. (Fig. 2954.)

Convolvulus arvensis L. Sp. Pl. 153. 1753.

Glabrous, or nearly so; stems trailing or decumbent, very slender, 1°–2½° long, simple or branched. Leaves slender-petioled, ovate or oblong, entire, obtusish and mucronulate or acutish at the apex, sagittate or somewhat hastate at the base, 1′–2′ long, the basal lobes spreading, acute; peduncles 1–4-flowered (commonly 2-flowered), shorter than the leaves; 1–3-bracted at the summit, usually with another bract on one of the pedicels; sepals oblong, obtuse, 1½″ long; corolla pink or nearly white, 8″–12″ broad; calyx not bracted at the base; stigmas linear.

In fields and waste places, Nova Scotia to Ontario, south to New Jersey, Pennsylvania and Kansas. Naturalized from Europe. Native also of Asia. May–Sept. Old names, Hedge-bells, Bearbind, Corn-Lily, Wind, Bellbine, Corn-bind, Lap-love, Sheep-bine.

5. Convolvulus incànus Vahl. Hoary Bindweed. (Fig. 2955.)

Convolvulus incanus Vahl, Symb. Bot. 3: 23. 1794.

Finely and densely canescent, pale, or sometimes greener; stems procumbent or trailing, usually branched, 1°–3° long. Leaves rather short-petioled, lanceolate, ovate to linear in outline, usually with 2–4 divergent lobes at the base, or the lower pair of lobes reflexed, otherwise entire or irregularly dentate, obtuse and mucronulate at the apex, 1′–2′ long; peduncles 1–2-flowered, as long as or longer than the leaves, minutely bracted at the summit; pedicels 3″–6″ long; sepals oblong, obtuse or mucronulate, about 3″ long; corolla white to rose-color; stigmas narrowly linear; capsule globose, about as long as the sepals.

In waste places near Lincoln, Neb. (according to Webber). In dry soil, Kansas and Arkansas to Arizona, Mexico and Texas. Also in southern South America. April–Aug.

Family 20. CUSCUTÀCEAE Dumort, Anal. Fam. 20. 1829.

DODDER FAMILY.

White or yellow slender parasites, dextrorsely twining, the leaves reduced to minute alternate scales. Calyx inferior, 5-lobed or 5-parted (rarely 4-lobed or 4-parted), or of 5 distinct sepals. Corolla campanulate, ovoid, urceolate or cylindric, 5-lobed (rarely 4-lobed), the lobes imbricated in the bud, the tube bearing as many fimbriate or crenulate scales as there are lobes and alternate with them, or these sometimes obsolete. Stamens as many as the corolla-lobes and alternate with them, inserted in the throat or sinuses above the scales, short-exserted or included; filaments short or slender; anthers short, ovate or oval, obtuse, 2-celled, the sacs longitudinally dehiscent. Ovary globose to oblong, 2-celled; ovules 2 in each cavity; styles 2, terminal, separate, or rarely united below; stigmas linear or capitate. Capsule globose or ovoid, circumscissile, irregularly bursting or indehiscent, 1–4-seeded. Seeds glabrous, globose or angular; embryo linear, terete, curved or spiral, its apex bearing 1–4 minute alternate scales, endosperm fleshy; cotyledons none.

1. CÚSCUTA L. Sp. Pl. 124. 1753.

Characters of the family. The filiform twining stems are parasitic on herbs and shrubs by numerous minute suckers. The seeds germinate in the soil and the plantlet attaches itself to its host, its root and lower portion soon perishing. The subsequent nutrition of the parasite is apparently wholly through its suckers. Indications of a small amount of coloring matter, possibly chlorophyll, have been observed in one species. [Name from the Arabic.]

About 100 species, of wide geographic distribution. Besides the following, some 15 others occur in the southern and western parts of North America. Known as Dodder, or Strangle-weed.

* Corolla-scales crenulate; stigmas slender; capsule circumscissile.

Scales crenulate above, not incurved. 1. *C. Epilinum.*
Scales crenulate all around, strongly incurved. 2. *C. Epithymum.*

* * Corolla-scales fringed; stigmas capitate; capsule indehiscent.

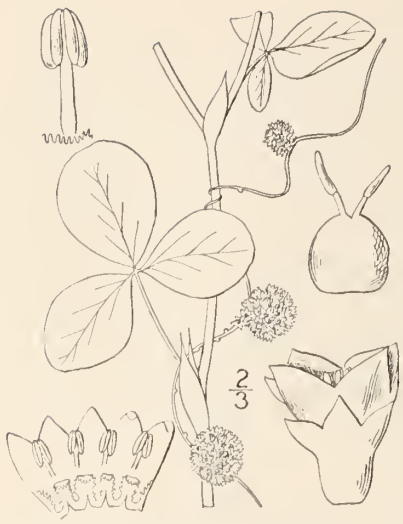
Sepals united below into a gamosepalous calyx.
  Flowers very nearly sessile; corolla persistent at the base of the capsule.
    Corolla-scales ovate, fringed all around; calyx-lobes obtuse. 3. *C. arvensis.*
    Corolla-scales abortive, or of a few processes: calyx-lobes acutish. 4. *C. Polygonorum.*
  Flowers distinctly pedicelled; corolla enclosing or capping the capsule, or at length deciduous.
    Tips of the corolla-lobes incurved or reflexed.
      Scales ovate, fringed all around; capsule enclosed by the corolla. 5. *C. indecora.*
      Scales abortive, or of a few slender processes; corolla capping the capsule. 6. *C. Coryli.*
    Corolla-lobes spreading or recurved.
      Scales small, irregularly fringed; capsule depressed-globose. 7. *C. Cephalanthi.*
      Scales long, fringed mainly above; capsule pointed.
        Corolla 1½″ long; capsule globose, short-pointed. 8. *C. Gronovii.*
        Flowers 2″–3″ long; capsule oval, long-pointed. 9. *C. rostrata.*
Sepals separate, subtended by similar bracts.
  Flowers cymose, pedicelled; scales short; bracts entire. 10. *C. cuspidata.*
  Flowers closely sessile in dense clusters; bracts serrulate.
    Bracts few, broad, appressed; styles as long as the ovary. 11. *C. compacta.*
    Bracts numerous, narrow, their tips recurved; styles longer than the ovary. 12. *C. paradoxa.*

1. Cuscuta Epilinum Weihe. Flax Dodder. (Fig. 2956.)

Cuscuta Epilinum Weihe, Archiv. Apoth. 8: 54. 1824.
Cuscuta densiflora Soyer-Willem. Act. Soc. Linn. Paris, 4: 281. 1826.

Stems very slender, yellow or red; flowers sessile in dense clusters, yellowish white, about 1½″ long. Calyx hemispheric, 5-lobed, the lobes ovate, acute, as long as the corolla-tube; corolla short, cylindric, becoming urceolate, 5-lobed, the lobes ovate, acutish, spreading, its scales short, erect, less than one-half the length of the tube, 2-cleft or emarginate, crenulate above, the crenulations not extending to the base; stigmas linear-filiform; capsule circumscissile, the withering corolla borne on its summit.

On flax, Nova Scotia to New Jersey and Pennsylvania. Introduced from Europe. Native also of Asia. July–Aug.



2. Cuscuta Epíthymum Murr. Thyme Dodder. Lesser or Clover Dodder. (Fig. 2957.)

Cuscuta Epithymum Murr. in L. Syst. Ed. 13, 140. 1774.
Cuscuta Trifolii Bab. Phytol. 1: 467. 1843.

Stems filiform, red; flowers sessile in small dense clusters, pinkish, about 1″ long. Calyx variable, 4-5-lobed, more than one-half the length of the cylindric corolla-tube, the lobes acute; corolla 4-5-lobed, the lobes erect, about one-half as long as the tube, acute, its scales strongly incurved, crenulate nearly or quite to the base; stigmas filiform; capsule circumscissile, capped by the withering corolla.

On clover, Ontario (according to Fowler); Alder Lake, N. Y., on *Aster lateriflorus*; Sellersville, and Susquehanna Co., Pa. Introduced from Europe, where it occurs on thyme, clover and other low plants. July–Sept.

3. Cuscuta arvénsis Beyrich. Field Dodder. (Fig. 2958.)

Cuscuta arvensis Beyrich; Hook. Fl. Bor. Am. 2: 77. As synonym. 1834.

Plant pale yellow; stems filiform, the flowers nearly sessile in small clusters. Calyx broad, 5-lobed, the lobes broad, obtuse; corolla nearly campanulate, 5-lobed, the lobes acute or acuminate, as long as the tube, their tips reflexed, its scales large, ovate, as long as or longer than the tube, densely fringed all around with short irregular processes; stamens not exserted; style shorter than the ovary; stigmas capitate; capsule depressed-globose, indehiscent, the withering corolla and usually the stamens persistent at its base.

On various herbs and low shrubs, New York to Manitoba and the Northwest Territory, south to Florida, Texas, Mexico and California. Also in South America. July–Aug.

4. Cuscuta Polygonòrum Engelm. Smart-weed Dodder. (Fig. 2959.)

Cuscuta Polygonorum Engelm. Am. Journ. Sci. 43: 342. *pl. 6. f. 26–29.* 1842.
C. chlorocarpa Engelm.; A. Gray, Man. 350. 1848.

Plant orange-yellow; stems slender but rather coarse; flowers sessile or nearly so in dense clusters. Calyx short, 4-5-lobed, the lobes ovate-oblong, acute or acutish; lobes of the corolla 4 or 5, triangular-ovate, acute, mostly as long as the tube, the scales usually obsolete, wanting, or consisting of only 2 or 3 slender processes on each side of the attached lower portion of the filament; filaments mostly slender; styles shorter than the ovary; stigmas capitate; capsule globose, the withering corolla persistent at its base.

On *Polygonums* and other herbs, Minnesota to Arkansas in the Mississippi Valley. Also in Pennsylvania and Delaware. Range probably more extensive. July–Sept.

5. Cuscuta indecòra Choisy. Pretty Dodder. (Fig. 2960.)

Cuscuta indecora Choisy, Mem. Soc. Gen. 9: 278. *pl. 3. f. 5.* 1841.
C. pulcherrima Scheele, Linnaea, 21: 750. 1848.
Cuscuta decora Choisy; Engelm. Trans. St. Louis Acad. 1: 501. 1859.

Stems rather stout; flowers 1½″ long, pedicelled in loose cymes, more or less papillose. Calyx 5-lobed, the lobes ovate to lanceolate, acute, mostly shorter than the corolla-tube; corolla campanulate, 5-lobed, the lobes triangular, minutely crenulate, spreading, nearly as long as the tube, their tips inflexed; scales ovate, erect, irregularly fringed with short processes all around; stamens slightly exserted, or included; stigmas capitate; capsule oblong, acute, enveloped by the withering corolla.

On various herbs and low shrubs, Illinois to Nebraska, south to Florida, Texas and Mexico, in several forms. Also in the West Indies and South America. Corolla white; stigmas often yellow or purple. June–Aug.

6. Cuscuta Córyli Engelm. Hazel Dodder. (Fig. 2961.)

Cuscuta Coryli Engelm. Am. Journ. Sci. 43: 337. *f. 7–11.* 1842.
Cuscuta inflexa Engelm. Trans. St. Louis Acad. 1: 502. 1859.

Stems coarse; flowers about 1″ long, pedicelled in loose, or rather dense cymes. Calyx 4–5-lobed, the lobes triangular or triangular-lanceolate, acutish, about as long as the corolla-tube; corolla campanulate, 4–5-lobed, the lobes minutely crenulate, nearly erect, triangular, acute, about as long as the tube, their tips inflexed; scales small, oval, obtuse, often with only a few processes on each side; stamens scarcely exserted; styles shorter than the ovary; stigmas capitate; capsule oblong, pointed, enveloped or at length capped by the withering corolla.

On the hazels and other shrubs or tall herbs, Connecticut to Virginia, west to Nebraska and Arkansas. July–Aug.

7. Cuscuta Cephalánthi Engelm. Button-bush Dodder. (Fig. 2962.)

Cuscuta Cephalanthi Engelm. Am. Journ. Sci. 43: 336. *pl. 6. f. 1–6.* 1842.
Cuscuta tenuiflora Engelm.; A. Gray, Man. 350. 1848.

Plant yellow, stems rather coarse; flowers about 1″ long, short-pedicelled, clustered; calyx 5-lobed, the lobes ovate, obtuse, shorter than the corolla-tube; corolla cylindric-campanulate, its lobes ovate, obtuse and rounded, spreading, one-half the length of the tube or less; scales about as long as the lobes, fringed mainly toward the apex with irregular processes; stamens included; styles slender, about as long as the ovary, shorter than the ripe capsule; stigmas capitate; capsule depressed-globose, 1½″ in diameter, surrounded or capped by the withering, at length deciduous corolla.

On shrubs and tall herbs, Pennsylvania to Minnesota and the Northwest Territory, south to Texas and Arizona. July–Aug.

8. **Cuscuta Gronòvii** Willd. Gronovius' Dodder. Love-vine. (Fig. 2963.)

C. Gronovii Willd.; R. & S. Syst. 6: 205. 1820. *Cuscuta vulgivaga* Engelm. Am. Journ. Sci. 43: 338. *pl. 6 f. 12–16.* 1842.

Stems yellow to orange, slender, high-climbing; flowers usually short-pedicelled, numerous in dense cymes. Calyx not bracted, its lobes ovate, obtuse, shorter than the corolla-tube; corolla campanulate, about 1½″ long, the lobes ovate, obtuse, rounded, spreading, nearly as long as the tube, the scales narrow, equalling or longer than the tube, thickly fringed about the summit and sparingly along the sides with long slender processes; styles slender, not as long as the ovary; stigmas capitate; capsule globose, short-pointed or pointless, 1½″ in diameter, enveloped or capped by the withering deciduous corolla.

On herbs and low shrubs, Nova Scotia to Manitoba, Florida and Texas. Variable. July–Aug.

9. **Cuscuta rostràta** Shuttlw. Beaked Dodder. (Fig. 2964.)

Cuscuta rostrata Shuttlw.; Engelm. Bost. Journ. Nat. Hist. 5: 225. 1845.

Stems coarse, yellowish white; flowers larger than in any of our other species, loosely cymose, pedicelled. Calyx gamosepalous, 5-lobed, the lobes ovate-triangular, shorter than the corolla-tube; corolla campanulate, 2″–3″ long, white, its lobes broadly ovate, obtuse, about as long as the calyx-lobes; scales narrow, sometimes spatulate, shorter than the tube, heavily fringed at the summit and sparingly along the sides with long slender processes; stamens included; styles slender, about as long as the flask-shaped ovary; stigmas capitate; capsule oval, long-beaked.

On herbs and shrubs, Maryland to South Carolina and Georgia in the Alleghanies. July–Sept.

10. **Cuscuta cuspidàta** Engelm. Cuspidate Dodder. (Fig. 2965.)

Cuscuta cuspidata Engelm. Bost. Journ. Nat. Hist. 5: 224. 1845.

Plant yellowish; stems slender; flowers in loose paniclcd cymes, about 1½″ long. Calyx of 5 distinct entire sepals, shorter than the corolla-tube, with 2–4 similar bracts at its base and often others on the pedicels; sepals orbicular to lanceolate, cuspidate, mucronate or acuminate; corolla nearly salverform, its lobes triangular-lanceolate or oblong, acute or cuspidate, spreading, about one-half the length of the tube; scales narrow, usually less than one-half as long as the tube, fringed all around with short irregular processes; stamens not exserted; styles very slender, longer than the ovary; stigmas capitate; capsule bearing the withered corolla on its summit.

On coarse herbs, Nebraska to Missouri and Texas. July–Sept.

11. Cuscuta compácta Juss. Compact Dodder. (Fig. 2966.)

Cuscuta compacta Juss.; Choisy, Mem. Soc. Gen. 9: 281. *t. 4. f. 2.* 1841.

Plant yellowish white, stems rather stout; flowers about 2″ long, closely sessile in dense clusters. Calyx of 5 (rarely 4) distinct oval crenulate obtuse sepals, subtended by 3–5 similar rhombic-orbicular appressed serrulate bracts; corolla salverform, persistent, the tube cylindric, its 5 (rarely 4) lobes oblong or ovate, obtuse, spreading, much shorter than the tube, the scales narrow, one-half the length of the tube, fringed with numerous long processes; stamens included; styles slender, shorter than or as long as the ovary; capsule oblong, enveloped or capped by the withering corolla.

On shrubs, Ontario to southern New York and Alabama, west to Kansas and Texas. July–Sept.

12. Cuscuta paradóxa Raf. Glomerate Dodder. (Fig. 2967.)

Cuscuta paradoxa Raf. Ann. Nat. 13. 1820.
Cuscuta glomerata Choisy, Mem. Soc. Gen. 9: 184. *pl. 4. f. 1.* 1841.
Lepidanche compositarum Engelm. Am. Journ. Sci. 43: 344. *f. 30–35.* 1842.

Plant yellowish white, stems slender; flowers sessile, 1½″ long, exceedingly numerous in dense confluent clusters covering portions of the stem of the host-plant. Calyx of 5 distinct concave oblong obtuse serrulate sepals, subtended by 8–15 narrower serrulate much imbricated bracts with recurved tips; corolla tube oblong-cylindric, its lobes oblong-lanceolate or triangular-lanceolate, obtuse, spreading or recurved, persistent; scales copiously fringed at the summit and sparingly along the sides with numerous long processes; styles 2–4 times as long as the ovary; capsule capped by the withering corolla.

On tall herbs, mainly Compositae, Ohio to Minnesota, Missouri and Texas. July–Sept.

Family 21. **POLEMONIÀCEAE** DC. Fl. Franc. 3: 645. 1805.

PHLOX FAMILY.

Herbs, some species slightly woody, with alternate or opposite entire lobed or dissected leaves. Flowers perfect, corymbose-capitate, cymose or paniculate, regular, or nearly regular. Calyx inferior, tubular or campanulate, 5-cleft, the lobes or teeth slightly imbricated. Corolla gamopetalous, funnelform, saucer-shaped, campanulate or rotate, the limb 5-parted, the lobes contorted. Stamens 5, inserted on the tube of the corolla and alternate with its lobes; filaments slender or filiform; anthers ovate, oblong or linear, versatile, 2-celled, the sacs longitudinally dehiscent. Ovary superior, mostly 3-celled; ovules 2–∞ in each cavity, amphitropous; style simple, filiform; stigmas 3, linear. Capsule mostly loculicidally 3-valved. Seeds various, sometimes winged, sometimes enveloped in mucilage and emitting spiral tubes when wetted; endosperm present; embryo straight; cotyledons flat; radicle inferior.

About 10 genera and 200 species, most abundant in Western America, a few in temperate Europe and Asia.

Calyx distended and at length ruptured by the ripening capsule.
Corolla salverform; leaves opposite, entire. 1. *Phlox.*
Corolla funnelform, tubular, salverform or campanulate; leaves alternate or opposite.
2. *Gilia.*

Calyx not distended nor ruptured by the capsule; leaves alternate.
Calyx-teeth herbaceous, not spinulose-tipped.
Stamens declined; leaves pinnate. 3. *Polemonium.*
Stamens straight and leaves entire in our species. 4. *Collomia.*
Calyx-teeth spinulose-tipped; leaves pinnatifid. 5. *Naverretia.*

1. PHLÓX L. Sp. Pl. 151. 1753.

Perennial or rarely annual, erect or diffuse herbs, with opposite entire leaves, or some of the upper ones alternate, and large blue purple red or white flowers, in terminal cymes or cymose panicles. Calyx tubular or tubular-campanulate, 5-ribbed, 5-cleft, the lobes acute or acuminate, mostly scarious-margined and the sinuses commonly scarious. Corolla salver-form, the tube narrow, the limb 5-lobed; lobes obovate, orbicular or obcordate, spreading. Stamens straight, short, unequally inserted on the corolla-tube. Ovary oblong or ovoid, 3-celled; style usually slender; ovules 1–4 in each cavity. Capsule ovoid, 3-valved, at length distending and rupturing the calyx-tube. Seeds ovoid, wingless or narrowly winged, not emitting spiral threads when wetted. [Greek, flame.]

About 30 species, natives of North America and Russian Asia. Besides the following some 14 others occur in the southern and western parts of North America.

Leaves flat, ovate, oblong, lanceolate or linear.
Cymes panicled; flowers short-pedicelled or sessile.
Calyx-teeth subulate; leaves oblong, oblong-lanceolate or ovate-lanceolate. 1. *P. paniculata.*
Calyx-teeth lanceolate, acute; leaves lanceolate or ovate, acuminate. 2. *P. maculata.*
Cymes corymbose, simple, or flowers scattered.
Flowering stems erect or ascending, simple.
Plants glabrous or nearly so.
Leaves ovate or oblong; calyx-teeth acute. 3. *P. ovata.*
Leaves lanceolate or linear; calyx-teeth subulate-lanceolate. 4. *P. glaberrima.*
Plants pubescent, hirsute or villous.
Stems erect or ascending; no prostrate sterile shoots.
Leaves linear or lanceolate, acuminate, spreading. 5. *P. pilosa.*
Leaves linear-oblong, acute or obtuse, nearly erect. 6. *P. amoena.*
Stems ascending or reclining; sterile shoots prostrate.
Lower leaves and those of the sterile shoots oblong or ovate. 7. *P. divaricata.*
Lower leaves and those of the sterile shoots obovate. 8. *P. reptans.*
Stems diffusely branched, usually creeping; leaves narrow.
Corolla-lobes cleft to or about the middle. 9. *P. bifida.*
Corolla-lobes cleft only at the apex. 10. *P. Stellaria.*
Corolla-lobes rounded; western. 11. *P. Kelseyi.*
Leaves subulate, fascicled or crowded; plants low.
Stems creeping or ascending; flowers cymose; eastern. 12. *P. subulata.*
Densely tufted; flowers mostly solitary; western.
Leaves densely white-woolly, 1″ long; plant moss-like. 13. *P. bryoides.*
Leaves less woolly or merely ciliate, 2″–6″ long.
Corolla-tube shorter than or equalling the calyx. 14. *P. Hoodii.*
Corolla-tube longer than the calyx 15. *P. Douglasii.*

1. Phlox paniculàta L. Garden Phlox. (Fig. 2968.)

Phlox paniculata L. Sp. Pl. 151. 1753.

Stem erect, stout or slender, simple or branched above, glabrous or puberulent, 2°–6° high. Leaves thin, sessile or short-petioled, oblong, oblong-lanceolate or ovate-lanceolate, acute or acuminate at the apex, narrowed at the base, or the uppermost subcordate, 2′–6′ long, ½′–1½′ wide; flowers short-pedicelled in compact paniculate cymules, the inflorescence often 12′ long; calyx-teeth subulate, glabrous, puberulent or glandular, more than one-half as long as the tube; corolla pink, purple or white, its lobes broadly obovate, rounded, entire, shorter than its tube; capsule oval, obtuse, slightly longer than the ruptured calyx-tube.

In woods and thickets, Pennsylvania to Florida, west to Illinois and Louisiana. Freely escaped from gardens in the north and east. July–Sept.

2. Phlox maculàta L. Wild Sweet-William. (Fig. 2969.)

Phlox maculata L. Sp. Pl. 152. 1753.
Phlox suaveolens Ait. Hort. Kew. 1: 206. 1789.

Stem slender, erect, simple, or branched above, glabrous or puberulent, usually flecked with purple, 1½°–3° high. Leaves lanceolate or the upper ovate-lanceolate, glabrous, rather firm, long-acuminate, sessile, rounded or subcordate at the base, 2′–5′ long, widest just above the base, the lowest sometimes linear-lanceolate; flowers short-pedicelled, the compact cymules forming an elongated narrow thyrsoid panicle; calyx-teeth triangular-lanceolate, acute, or acuminate, about one-fourth the length of the tube; corolla pink or purple, rarely white, its lobes rounded, shorter than the tube; capsule similar to that of the preceding species.

In moist woods and along streams, New Jersey to Florida, west to Minnesota and Tennessee. Occasionally escaped from gardens further north. *P. maculata* var. *candida* Michx. (*P. suaveolens* Ait.) is a form with white flowers and unspotted stem, occurring with the type. June–Aug.

3. Phlox ovàta L. Mountain Phlox. (Fig. 2970.)

Phlox ovata L. Sp. Pl. 152. 1753.
Phlox Carolina L. Sp. Pl. Ed. 2, 216. 1762.

Glabrous or nearly so throughout; stems simple, slender, ascending from a decumbent base, 1°–2° high. Leaves rather firm, the upper ovate or ovate-lanceolate, sessile by a rounded or subcordate base, acute at the apex, 1′–2′ long, the lower and basal ones longer, oblong or ovate-oblong, acute at both ends, narrowed into slender often margined petioles; flowers short-pedicelled in corymbed or sometimes simple cymes; calyx-teeth lanceolate or triangular-lanceolate, acute, or acuminate, one-third to one-half the length of the tube; corolla pink or red, its lobes obovate, rounded, entire.

In woods, Pennsylvania to North Carolina and Alabama, mostly in the mountains. May–Aug.

4. Phlox glabérrima L. Smooth Phlox. (Fig. 2971.)

Phlox glaberrima L. Sp. Pl. 152. 1753.

Glabrous or nearly so throughout; stem simple, slender, erect or ascending, 1°–2° high. Leaves lanceolate or linear, rather firm, mostly 1-nerved, acuminate at the apex, narrowed at the base, 1½′–4′ long, 2″–6″ wide, sessile, or the lowest linear or oblong, obtusish, shorter, and short-petioled; flowers short-pedicelled, the cymules corymbed; calyx-teeth subulate-lanceolate, one-third to one-half the length of the tube; corolla commonly pink, its lobes obovate, rounded, or obcordate, longer than the tube.

In open woods and on prairies, Virginia to Wisconsin, south to Florida and Kentucky. Ascends to 2200 ft. in Virginia. Broad-leaved southern forms approach the preceding species. May–July.

5. Phlox pilòsa L. Downy Phlox. (Fig. 2972.)

Phlox pilosa L. Sp. Pl. 152. 1753.

Soft downy or hairy, often glandular; stem erect or ascending, simple or branched, slender, 1°–2° high. Leaves linear or lanceolate, spreading or divaricate, long-acuminate, 1′–3′ long, 1½″–4″ wide, sessile, the base narrowed or rounded; cymules corymbed; flowers short-pedicelled; calyx glandular, viscid, its teeth setaceous-subulate, longer than the tube; corolla pink, purple, or white, its lobes obovate, entire, the tube usually pubescent; capsule shorter than the calyx.

In dry soil, Ontario to Manitoba, New Jersey, Florida, Akansas and Texas. April–June.

6. Phlox amoèna Sims. Hairy Phlox. (Fig. 2973.)

Phlox amoena Sims, Bot. Mag. *pl. 1308.* 1810.

Usually quite hairy; stems simple, slender, ascending, 6′–18′ high. Leaves linear-oblong, sessile, acute or obtuse at the apex, mostly narrowed at the base, nearly erect, ½′–1½′ long, 1½″–2½″ wide, the lowest much shorter; flowers very nearly sessile in a dense terminal simple or somewhat compound cyme, which is subtended by the uppermost pair of leaves; calyx hirsute, its teeth subulate, as long as or shorter than the tube; corolla pink or white, its lobes obovate, entire or rarely emarginate, shorter than the glabrous tube.

In dry soil, Virginia to Tennessee, Florida and Georgia. April–June.

7. Phlox divaricàta L. Wild Blue Phlox. (Fig. 2974.)

Phlox divaricata L. Sp. Pl. 152. 1753.

Finely viscid-pubescent; stems ascending or diffuse, slender, producing creeping or ascending leafy shoots from the base. Leaves of the sterile shoots oblong or ovate, obtuse, 1′–2′ long, those of the flowering stems lanceolate, ovate-lanceolate, or oblong, mostly acute or acutish; flowers pedicelled in open corymbed cymules, faintly fragrant; calyx-teeth subulate, longer than the tube; corolla bluish, its lobes obcordate, emarginate or entire, not very much longer than the tube; capsule oblong-globose, about 2″ high.

In moist woods, Ontario to Minnesota, south to Pennsylvania, Florida, Louisiana and Arkansas. Ascends to 3700 ft. in Virginia. Sometimes called Wild Sweet William. April–June.

8. Phlox réptans Michx. Crawling Phlox. (Fig. 2975.)

Phlox reptans Michx. Fl. Bor. Am. 1: 145. 1803.

Hirsute or pubescent; stems slender, diffuse, producing sterile creeping leafy shoots from the base. Leaves of the sterile shoots obovate, obtuse at the apex, 1′–3′ long, narrowed at the base into petioles; flowering stems 4′–8′ high, their leaves oblong or lanceolate, acute or obtuse, smaller; flowers in a simple or barely compound cyme, slender-pedicelled; calyx-teeth linear-subulate, as long as the tube or longer; corolla pink, purple, or violet, its lobes rounded, mostly entire, about one-half the length of the tube; capsule subglobose, 1½″ high.

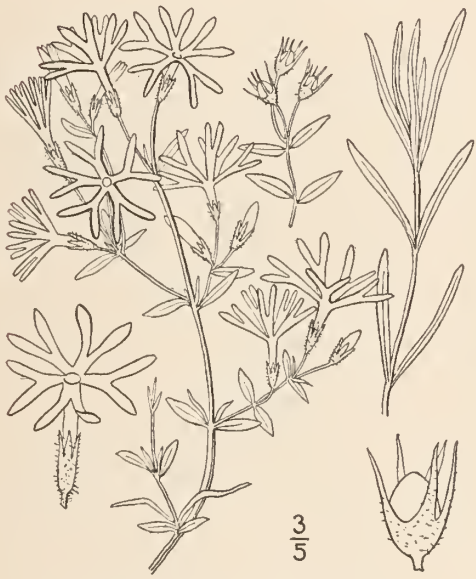
In woods, Pennsylvania to Georgia and Kentucky, mainly in the mountains. Ascends to 4500 ft. in Virginia. April–June.

9. Phlox bífida Beck. Cleft Phlox. (Fig. 2976.)

P. bifida Beck, Am. Journ. Sci. 11: 170. 1826.

Puberulent or pubescent; stems diffuse, somewhat woody, much branched, slender, often 1° long, the branches erect or ascending, 4′–8′ high. Leaves of sterile shoots linear, sessile, 1′–2′ long, 1″–2″ wide, acute, those of flowering branches linear-oblong or lanceolate, much shorter; flowers in simple cymes or solitary in the axils, slender-pedicelled; pedicels 3″–12″ long; calyx-teeth lanceolate-subulate, somewhat longer than the tube; corolla pale purple, its lobes shorter than the tube, cuneate, 2–3-cleft to about the middle into linear or oblong obtuse diverging segments; capsule oblong-globose, 1″–1½″ high.

In dry places, Indiana to Tennessee and Michigan. April–June.



10. Phlox Stellària A. Gray. Chickweed Phlox. (Fig. 2977.)

Phlox Stellaria A. Gray, Proc. Am. Acad. 8: 252. 1870.

Glabrous or puberulent; stems diffuse, somewhat woody, much branched, the branches nearly erect, 3′–8′ high. Leaves all linear, or linear-lanceolate, sessile, acute, 1′–2′ long, 1″–1½″ wide; flowers in simple cymes or solitary in the axils, slender-pedicelled; calyx-teeth subulate-lanceolate, shorter than the tube; corolla pale blue or nearly white, its lobes cuneate, 2-lobed at the apex, nearly as long as the tube.

On cliffs, southern Illinois and Kentucky. April–May.

11. Phlox Kélseyi Britton. Kelsey's Phlox. (Fig. 2978.)

Phlox Kelseyi Britton, Bull. Torr. Club, 19: 225. 1892.

Many-stemmed from a woody root, the stems spreading, creeping, or ascending, sometimes 8′ long, glabrous, or slightly pubescent above, very leafy. Leaves oblong, or linear-oblong, sessile, glabrous, or nearly so, 3″–12″ long, 1″–2″ wide, or the upper longer and narrower, thick, rigid, the apex spinose-mucronate, the revolute margins ciliate; flowers sessile, or short-peduncled; peduncles and calyx somewhat glandular-pubescent, or glabrous; calyx-teeth subulate, as long as the tube, or longer; corolla-tube somewhat exceeding the calyx, the limb about 8″ broad, blue or lilac, the obovate-cuneate lobes rounded or truncate.

North Dakota to Nebraska and Montana. May–June.

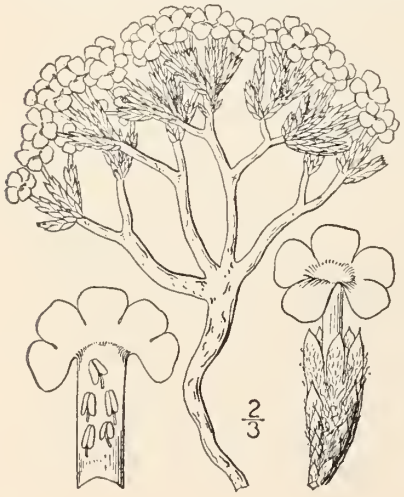
12. Phlox subulàta L. Ground or Moss Pink. (Fig. 2979.)

Phlox subulata L. Sp. Pl. 152. 1753.

Pubescent or becoming glabrate, evergreen; stems tufted, forming mats, diffuse, much branched, the branches 2′–6′ long. Leaves subulate-linear, linear-lanceolate or linear-oblong, acute or acuminate, 4″–10″ long, ½″–1″ wide, spreading, ciliate, rigid, commonly fascicled at the nodes; flowers in simple cymes, slender-pedicelled; calyx-teeth subulate from a broader base, about as long as the tube; corolla pink, purple or white, its lobes obcordate or entire, shorter than the tube; capsule oblong, nearly 2″ high.

In dry sandy or rocky soil, southern New York to Florida, west to Michigan and Kentucky. Ascends to 3500 ft. in West Virginia. April–June.

13. Phlox bryoìdes Nutt. Moss Phlox. (Fig. 2980.)



Phlox bryoides Nutt. Journ. Acad. Phila. (II.) 1: 153. 1848.

Depressed, shrubby, moss-like, densely branched from a deep woody root, forming compact tufts 2′–3′ high. Leaves minute (about 1″ long), closely imbricated in 4 ranks, copiously white-woolly, triangular-lanceolate, pale, acute, the margins infolded; flowers solitary and sessile at the ends of the branches, about 2½″ long; tube of the corolla longer than the calyx, its lobes broadly cuneate, entire.

On dry hills, western Nebraska and Wyoming. May–July.

14. Phlox Hoòdii Richards. Hood's Phlox. (Fig. 2981.)

Phlox Hoodii Richards. App. Frank. Journ. 733. *pl. 28.* 1823.

Densely tufted and branched from a woody root, 2′–4′ high. Leaves imbricated, erect, rigid, subulate, mucronate, somewhat woolly or ciliate, becoming glabrate, 2″–6″ long; flowers solitary and sessile at the ends of the branches, about 5″ long; calyx-teeth lanceolate, acuminate, rigid, longer than the tube; tube of the corolla shorter than or equalling the calyx, its lobes obovate, entire.

In dry sandy or rocky soil, Manitoba to the Northwest Territory, south to western Nebraska and Wyoming. May–July.

15. Phlox Douglásii Hook. Douglas' Phlox. (Fig. 2982.)

Phlox Douglasii Hook. Fl. Bor. Am. 2: 73. *pl. 158.* 1834.

Similar to the preceding species; leaves pubescent or glabrous, less imbricated, sometimes spreading, rigid, usually fascicled at the nodes, 4″–7″ long. Flowers solitary and sessile or short-pedicelled at the ends of the branches, 5″–8″ long; calyx-teeth narrowly lanceolate, acuminate, about equalling the tube; tube of the purple or white corolla longer than the calyx, its lobes obovate, entire.

Dry soil, Nebraska and Montana to Utah, California and British Columbia. May–July.

Phlox Douglásii andícola Britton, Mem. Torr. Club, 5: 269. 1894.
Phlox Douglasii longifolia A. Gray, Proc. Am. Acad. 8: 254. 1870. Not *P. longifolia* Nutt.
Leaves longer, 8″–12″ long, less fascicled at the nodes. Range of the type.

2. GÌLIA R. & P. Prodr. Fl. Per. 25. *pl. 4.* 1794.

Herbs with opposite or alternate, entire pinnatifid palmatifid or dissected leaves. Flowers small or large, solitary, cymose, capitate, thyrsoid, or paniculate. Calyx campanulate or tubular, 5-toothed or 5-cleft, the sinuses usually scarious. Corolla funnelform, tubular, campanulate or rarely salverform, 5-lobed, the lobes ovate, oblong, or obovate. Stamens equally or unequally inserted on the corolla, included or exserted. Ovary oblong or ovoid, 3-celled; ovules solitary or several in each cavity. Capsule ovoid or oblong, 3-celled, at length distending and rupturing the calyx. Seed-coat commonly mucilaginous when wetted, in some species emitting spiral thread-like tubes. [Named for Philip Gil, a Spanish botanist.]

About 75 species, natives of America. Besides the following, some 48 others occur in the southern and western parts of North America.

Leaves entire.
- Flowers paniculate. — 1. *G. gracilis.*
- Flowers narrowly thyrsoid-spicate. — 6. *G. spicata.*

Leaves pinnately divided, pinnatifid or palmatifid.
- Leaves palmatifid into 5–7 rigid subulate segments. — 2. *G. pungens.*
- Leaves pinnatifid or pinnately divided, the segments linear, not rigid.
  - Flowers thyrsoid-paniculate or corymbose-paniculate.
    - Corolla 1′–2′ long; plants 1°–4° tall.
      - Flowers paniculate, white. — 3. *G. longiflora.*
      - Flowers narrowly thrysoid, red. — 4. *G. aggregata.*
    - Corolla 3″–5″ long, violet or blue. — 5. *G. pinnatifida.*
  - Flowers narrowly thyrsoid-spicate. — 6. *G. spicata.*
  - Flowers in dense or capitate cymes, or heads.
    - Flower-clusters leafy-bracted.
      - Perennial; corolla-tube not longer than the calyx. — 7. *G. congesta.*
      - Annual; corolla-tube 2–3 times as long as the calyx. — 8. *G. pumila.*
    - Clusters bractless; corolla campanulate. — 9. *G. tricolor.*

1. Gilia grácilis Hook. Entire-leaved Gilia. (Fig. 2983.)

Gilia gracilis Hook. Bot. Mag. *pl. 2924.* 1829.
Collomia gracilis Dougl. in Benth. Bot. Reg. *pl. 1622.* 1833.

Annual, pubescent, at length corymbosely much branched, 2′–6′ high, the branches ascending. Lower and basal leaves oblong to spatulate, obtuse, commonly opposite and nearly sessile, the upper linear or lanceolate, sessile, ½′–1′ long, 1″–2″ wide, opposite or alternate, entire; cymes 1–5-flowered; calyx-lobes linear-subulate, usually longer than the tube; corolla 4″–6″ long, the tube yellowish, narrow, equalling or slightly longer than the calyx, the lobes purple or violet, short; ovules 2–3 in each cavity; capsule oblong, obtuse, as long as or longer than the calyx-tube; seeds mucilaginous when wet.

In dry or moist soil, western Nebraska, Colorado and New Mexico to British Columbia and California. April–Aug.

2. Gilia púngens (Torr.) Benth. Sharp-leaved Gilia. (Fig. 2984.)

Cantua pungens Torr. Ann. Lyc. N. Y. 2: 26. 1826.
Gilia pungens Benth. in DC. Prodr. 9: 316. 1845.

Shrubby, rigid, puberulent, glabrate, or somewhat viscid, usually much branched, 4′–8′ high. Leaves alternate, or the lower opposite, sessile, 3″–6″ long, palmately divided into 3–7 subulate rigid awl-shaped segments, often with smaller ones fascicled in their axils, sometimes densely imbricated; flowers solitary, or 2–3 together, sessile at the ends of the branches, 8″–12″ long; calyx-lobes subulate, as long as the tube, or shorter; corolla pink or white, funnelform, the tube longer than the calyx, the limb 5-lobed; ovules 8–10 in each cell; seeds not mucilaginous when wetted.

In dry rocky soil, Arizona to Colorado, Wyoming, California and British Columbia. [Not definitely known from within our area.] Plant fragrant in drying. May–July.

Gilia púngens caespitòsa (Nutt.) A. Gray, Proc. Am. Acad. 8: 268. 1870.
Leptodactylon caespitosum Nutt. Journ. Phil. Acad. (II.) 1: 157. 1848.
Low, densely tufted, 2′–3′ high; leaves much imbricated; flowers smaller. Scott's Bluffs, Nebraska (Nuttall, Rydberg). Probably a distinct species.

3. Gilia longiflòra (Torr.) Don. White-flowered Gilia. (Fig. 2985.)

Cantua longiflora Torr. Ann. Lyc. 2: 221. 1827.
Gilia longiflora Don, Gard. Dict. 4: 245. 1838.
Collomia longiflora A. Gray, Proc. Am. Acad. 8: 261. 1870.

Annual, glabrous, paniculately branched, 1°–2° high. Leaves all alternate, sessile, 1′–2½′ long, pinnately divided into linear-filiform segments or the uppermost entire; flowers numerous, white, paniculate, about 2′ long; calyx-teeth triangular-lanceolate, acuminate, shorter than the tube; corolla salverform, its tube narrow, 4 or 5 times as long as the orbicular or ovate, rounded or pointed, spreading lobes; stamens unequally inserted; ovules 8–12 in each cell; capsule narrowly oblong, exceeding or equalling the calyx; seed-coat mucilaginous and emitting spiral threads when wetted.

In dry soil, Nebraska and Colorado to Texas and Arizona. May–Sept.

Gilia coronopifòlia Pers., a related species with less spreading corolla-lobes, is commonly cultivated, and rarely escapes from gardens.

4. Gilia aggregàta (Pursh) Spreng. Scarlet Gilia. (Fig. 2986.)

Cantua aggregata Pursh, Fl. Am. Sept. 147. 1814.
Gilia aggregata Spreng. Syst. 1: 626. 1825.

Biennial, pubescent or puberulent; stem simple or sparingly branched, 2°–4° high, leafy at least below. Leaves alternate, the basal often tufted, mostly petioled, 1′–3′ long, pinnately parted into narrowly linear segments; inflorescence narrowly thyrsoid-paniculate, often 12′ long; flowers sessile or very nearly so in small peduncled clusters, scarlet or red; corolla tubular-funnelform, the tube 1′–1½′ long, slightly thicker upward, the limb cleft into ovate or lanceolate acute or acuminate spreading or recurved lobes; stamens unequally or about equally inserted in the throat; ovules numerous; seeds mucilaginous and emitting spiral threads when wetted.

In dry soil, western Nebraska (according to Coulter) to Texas and Mexico, west to British Columbia and California. June–Aug.

5. Gilia pinnatífida Nutt. Small-flowered Gilia. (Fig. 2987.)

Gilia pinnatifida Nutt.; A. Gray, Proc. Am. Acad. 8: 276. 1870.

Biennial or perennial from a deep root, much branched, viscid-glandular, 6′–2° high. Leaves thick, pinnatifid, the basal tufted, 1′–3′ long, the segments linear-oblong, sometimes toothed, obtuse or acutish, 2″–6″ long, those of the stem alternate, smaller, the uppermost minute and entire; flowers very numerous, small, paniculate, some sessile, some petioled; calyx 5-lobed, the lobes lanceolate to ovate; corolla salverform, 3″–5″ long, the limb violet or blue, its white tube longer than the calyx and its obovate lobes; stamens exserted; seeds not mucilaginous nor emitting spiral threads when wetted.

In sandy soil, western Nebraska and Wyoming to New Mexico. Perhaps includes two species. Has been mistaken for *G. inconspicua*. June–Aug.

6. Gilia spicàta Nutt. Spicate Gilia. (Fig. 2988.)

Gilia spicata Nutt. Journ. Acad. Nat. Sci. Phila. (II.) 1: 156. 1848.

Perennial, woolly-tomentose; stems erect, rather stout, simple, solitary, or 2–4 from the woody root, 6′–18′ high. Leaves alternate, narrowly linear, entire, or pinnately parted into 3–5 linear segments, 1′–2′ long; flowers in an elongated narrow spicate thyrsus, sessile in small clusters, purplish, 4″–6″ long; tube of the corolla somewhat exceeding the calyx, considerably longer than the ovate-oblong lobes; calyx-lobes acuminate; anthers equally inserted in the throat.

In dry soil, western Nebraska to Wyoming and Utah. May–Aug.

7. Gilia congésta Hook. Round-headed Gilia. (Fig. 2989.)

Gilia congesta Hook. Fl. Bor. Am. 2: 75. 1834.
Gilia iberidifolia Benth. in Hook. Kew. Journ. Bot. 3: 290. 1851.

Perennial by a deep root, woolly-tomentose, at least when young, branched from the base or also above, 3′–18′ high. Leaves mostly petioled, ½′–2′ long, pinnately divided into 3–9 narrowly linear sharp-pointed segments, or the uppermost entire; flowers white, densely capitate-clustered, 2″–3″ long, the clusters bracted by the upper leaves, ½′–1′ broad, sometimes corymbed; calyx-lobes awn-like; corolla-tube about the length of the calyx, slightly longer than the oval lobes; filaments equally inserted in or below the sinuses of the corolla; ovules 1–4 in each cavity.

In dry soil, Nebraska and Colorado to California, north to Montana and Oregon. May–Aug.

8. Gilia pùmila Nutt. Low Gilia. (Fig. 2990.)

Gilia pumila Nutt. Journ. Acad. Nat. Sci. Phila. (II.) 1: 156. 1848.

Annual, branched from the base and sometimes also above, woolly at least when young, 3′–8′ high. Leaves alternate, thick, ½′–1′ long, pinnately divided into linear mucronulate sometimes lobed segments, or the uppermost entire; flowers in dense or at length looser simple or compound cymes, sessile; corolla 3″–4″ long, its tube about 3 times the length of the lobes and twice as long as the calyx; calyx-lobes awn-like; stamens inserted in or below the sinuses of the corolla, somewhat exserted; ovules 5 or 6 in each cavity.

In dry soil, western Nebraska to Texas, west to Nevada and New Mexico. April–June.

9. Gilia trìcolor Benth. Tricolored Gilia. (Fig. 2991.)

Gilia tricolor Benth. Bot. Reg. *pl. 1622.* 1833.

Annual, viscid-puberulent, at least above; stems slender, commonly branched, 6′–2° high. Leaves alternate, slender-petioled, or the upper sessile, 2–3-pinnately divided into narrowly linear acute segments; lowest leaves sometimes 6′ long; flowers short-pedicelled, 5″–7″ long, in terminal peduncled simple cymes; calyx-lobes triangular-lanceolate, acute or acuminate, often purple-margined; corolla campanulate-funnelform, 2–3 times as long as the calyx, its tube yellowish, short, the throat brown-purple, the oval to orbicular lobes lilac or violet; stamens equally inserted at the sinuses; ovules several in the cavities; seeds mucilaginous and emitting spiral threads when wetted.

Escaped from gardens to roadsides at Lincoln, Neb. (according to Webber). Native of California. April–May.

3. POLEMÒNIUM L. Sp. Pl. 162. 1753.

Perennial or rarely annual herbs, with alternate pinnate membranous leaves, and mostly large cymose-paniculate or thyrsoid flowers. Calyx herbaceous, not angled nor ribbed, campanulate, 5-cleft to about the middle, accrescent in fruit, the segments lanceolate or ovate, entire, erect or connivent over the capsule. Corolla tubular-campanulate or tubular-funnelform, rarely rotate, blue, white, or yellow, the limb 5-lobed. Stamens about equally inserted near the base of the corolla, declined, the filaments slender, often pilose at the base. Ovary ovoid; ovules few or several in each cavity. Capsule ovoid, obtuse, 3-valved. Seeds wingless, or narrowly winged, mucilaginous and emitting spiral threads when wetted.

About 15 species, natives of the cooler parts of the north temperate zone. Besides the following, some 10 others occur in the western parts of North America.

Anthers exserted; flowers 8″–10″ broad; stem erect. 1. *P. Van Bruntiae.*
Anthers included; flowers 5″–6″ broad; stem reclining. 2. *P. reptans.*

1. Polemonium Van Brúntiae Britton. American Jacob's Ladder. (Fig. 2992.)

Polemonium coeruleum A. Gray, Man. Ed. 4, App. 1863. Not L. 1753.
Polemonium Van Bruntiae Britton, Bull. Torr. Club, 19: 224. *pl. 131.* 1892.

Rootstock stout, horizontal, clothed with fibrous roots. Stems erect, glabrous below, somewhat glandular-pubescent above, 1½°–2½° high, leafy to the top; leaflets of the lower leaves 15–19, short-stalked or sessile, ovate or lanceolate, acute, ½′–1½′ long, those of the upper fewer, the uppermost leaves 3–5-foliolate or simple; cymose clusters panicled or solitary, rather loosely 3–5-flowered; pedicels 2″–4″ long; flowers bluish-purple, 8″–10″ broad; corolla-lobes rounded; calyx 5-lobed to about the middle, much enlarged in fruit, the lobes acute; stamens exserted; ovules 3 or 4 in each cavity.

In swamps and along streams, Vermont and northern New York to Maryland. Differs from the Old World *P. coeruleum* L. in its stout rootstocks, more leafy stem, exserted stamens, and rounded corolla-lobes. May–July.

2. Polemonium réptans L. Greek Valerian. (Fig. 2993.)

Polemonium reptans L. Syst. Ed. 10, no. 1. 1759.

Glabrous or very nearly so throughout, usually not more than 1° high; stems weak, slender, at length reclining or diffuse, the rootstock short. Leaflets oblong, ovate-oblong, or lanceolate-oblong, ½′–1½′ long, the uppermost leaves 3–5-foliolate or simple; flowers blue, 5″–8″ broad; calyx 5-lobed, its lobes obtuse or acute; stamens not exserted; ovules 3 or 4 in each cavity.

In woods, New York to Minnesota, south to Georgia and Missouri. Ascends to 2200 ft. in Virginia. April–May.

4. COLLÒMIA Nutt. Gen. 1: 126. 1818.

Annual or rarely perennial herbs, with alternate mostly entire leaves, and purple white or reddish capitate or cymose flowers. Calyx obpyramidal or cup-shaped, 5-cleft, scarious in the sinuses, accrescent in fruit, not distended by nor ruptured by the ripening capsule, its

lobes lanceolate or triangular, entire, erect, the sinuses often at length enlarged into a revolute lobe. Corolla tubular-funnelform or salverform, the limb 5-lobed, spreading, the lobes obtuse. Stamens unequally inserted on the tube of the corolla, mostly straight, the filaments unequal. Ovules 1 or few in each cavity. Capsule oval to obovoid. Seeds of most species mucilaginous and emitting spiral threads when wetted. [Greek, gluten, referring to the glutinous seeds when wetted.]

About 10 species, natives of western America. Besides the following, some 6 others occur in the western United States and British Columbia.

1. Collomia lineàris Nutt. Narrow-leaved Collomia. (Fig. 2994.)

Collomia linearis Nutt. Gen. 1: 126. 1818.

Gilia linearis A. Gray, Proc. Am. Acad. 17: 223. 1882.

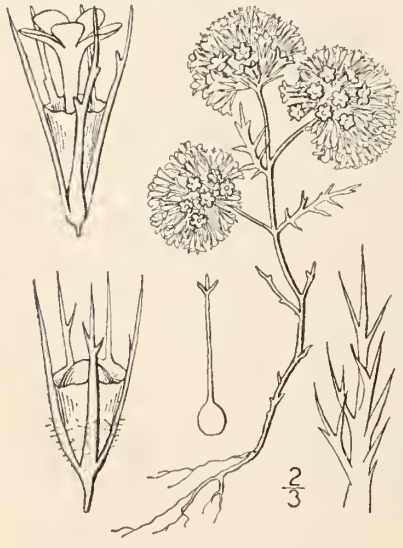
Annual, viscid-puberulent; stem erect, leafy, simple or branched, slender, 3′–18′ high. Leaves linear-oblong, lanceolate or linear-lanceolate, entire, acuminate at the apex, narrowed at the base, sessile, or the lower short-petioled, 1′–2½′ long, 1½″–6″ wide; flowers 5″–7″ long, numerous in terminal capitate leafy-bracted clusters; calyx-lobes triangular-lanceolate, acute; corolla light purple or nearly white, the tube very slender, longer than the calyx, the lobes 1″–2″ long; capsule at maturity about as long as the calyx.

In dry soil, Manitoba to Minnesota and Nebraska, west to British Columbia, Arizona and California. Also in New Brunswick. May–Aug.

5. NAVARRÈTIA R. & P. Prodr. Fl. Per. 20. 1794.

Annual glabrous or viscid-pubescent herbs, with alternate spinose-pinnatifid leaves, or the lowest entire, and numerous small flowers in dense terminal bracted clusters. Calyx prismatic or obpyramidal, the tube 5-angled, 5-cleft, not accrescent in fruit, not distended by nor ruptured by the ripening capsule, the sinuses scarious, the lobes mostly unequal, erect or spreading, spiny-tipped, entire, or often toothed. Corolla tubular-funnelform or salverform, 5-lobed, the lobes oval or oblong. Stamens straight or declined, equally inserted in or below the throat of the corolla. Ovary 2–3-celled; ovules solitary, few or several in each cavity. Capsule 1–3-celled, dehiscent or indehiscent. Seeds mostly mucilaginous and emitting spiral threads when wetted. [In honor of Navarrete, a Spanish physician.]

About 24 species, natives of western America. Besides the following, some 22 others occur in the western United States.



1. Navarretia mínima Nutt. Small Navarretia. (Fig. 2995.)

Navarretia minima Nutt. Journ. Acad. Nat. Sci. Phila. (II.) 1: 160. 1848.

Gilia minima A. Gray, Proc. Am. Acad. 8: 269. 1870.

Depressed, tufted, somewhat pubescent; stem usually branched, 1′–3′ high. Leaves sessile, ½′–1′ long, 1–2-pinnatifid into almost filiform rigid acicular segments; flowers about 2″ long, white (?), densely capitate; calyx-lobes awl-shaped, mostly toothed, about as long as the tube and equalling the corolla, the sinuses more or less white-pubescent; calyx-tube about equalling the indehiscent 1–6-seeded capsule.

In dry soil, Nebraska and South Dakota to Washington and Arizona. Summer.

Family 22. HYDROPHYLLÀCEAE Lindl. Nat. Syst. Ed. 2, 271. 1836.

WATER-LEAF FAMILY.

Herbs, mostly hirsute, pubescent or scabrous, with alternate or basal, rarely opposite leaves, and perfect regular 5-parted flowers, in scorpioid cymes, spikes or racemes, or rarely solitary. Calyx inferior, deeply cleft or divided, the sinuses sometimes appendaged. Corolla gamopetalous, funnelform, salverform, campanulate, or rotate. Stamens 5, inserted on the tube or base of the corolla, and alternate with its lobes; filaments filiform; anthers ovate, oblong, or linear, mostly versatile, 2-celled, the sacs longitudinally dehiscent. Disk annular, or none. Ovary superior, 2-celled, or 1-celled with 2 placentae; styles 2, separate, or partly united; stigmas small, terminal; ovules few or numerous, anatropous or amphitropous. Capsule 1–2-celled, mostly loculicidally 2-valved, rarely septicidally or irregularly dehiscent. Seeds oblong, globose, or angular, usually pitted, rugose or reticulated; endosperm fleshy or cartilaginous; embryo small; cotyledons half-terete or plano-convex.

About 17 genera and 160 species, mostly natives of western North America.

Styles united below; ovary 1-celled; leaves mostly lobed or dentate.	
Corolla-lobes convolute in the bud; placentae dilated.	
Stamens exserted.	1. *Hydrophyllum.*
Stamens not exserted.	
Sinuses of the calyx appendaged.	2. *Nemophila.*
Calyx much enlarged in fruit, its sinuses not appendaged.	3. *Macrocalyx.*
Corolla-lobes imbricated in the bud; placentae narrow.	4. *Phacelia.*
Styles distinct to the base; ovary 2-celled; leaves entire.	5. *Nama.*

1. HYDROPHÝLLUM L. Sp. Pl. 146. 1753.

Perennial or biennial herbs, with large lobed pinnatifid or pinnately divided leaves, and rather large, white blue or purple flowers, in terminal or lateral peduncled more or less scorpioid cymes. Calyx deeply 5-parted, the segments lanceolate or subulate, the sinuses naked or appendaged. Corolla tubular-campanulate or campanulate, 5-lobed, the lobes convolute in the bud, each with a linear appendage within, which extends to the base of the corolla and is incurved into a groove. Stamens 5, exserted; filaments pilose below or at the base; anthers linear or oblong, versatile. Ovary 1-celled, hispid-pubescent; placentae fleshy, dilated so as to nearly fill the cavity, free from the ovary-wall except at the top and bottom, each enclosing 2 ovules; styles united nearly to the summit. Capsule 2-valved. Seeds 1–4, globose-obovoid. [Greek, water-leaf, referring to the supposed cavity for water in each leaf.]

About 6 species, natives of North America.

Leaves, at least the lower, pinnatifid or pinnately divided.	
Calyx not appendaged in the sinuses or scarcely so.	
Plant sparingly pubescent; leaf-segments acute.	1. *H. Virginicum.*
Plant villous-hirsute; leaf-segments blunt.	2. *H. macrophyllum.*
Calyx with a reflexed appendage in each sinus.	3. *H. appendiculatum.*
Leaves palmately 5–9-lobed.	4. *H. Canadense.*

1. Hydrophyllum Virgínicum L. Virginia Water-leaf. (Fig. 2996.)

H. Virginicum L. Sp. Pl. 146. 1753.

Perennial by scaly rootstocks; stems slender, glabrous or nearly so, simple or sparingly branched, ascending or erect, rather weak, 1°–3° long. Lower and basal leaves long-petioled, 6′–10′ long, pinnately divided into 5–7 oblong ovate or ovate-lanceolate acute or acutish sharply toothed or incised segments 1′–2′ long, glabrous or with few scattered hairs; upper leaves similar, short-petioled, smaller, with fewer segments; cymes slender-peduncled, simple or forked, dense or at length open; flowers white or violet purple, darkest at high altitudes, short-pedicelled; pedicels strigose-pubescent; calyx-segments narrowly linear, hispid, spreading, the sinuses not appendaged; corolla about 4″ long; capsule globose, nearly 2″ in diameter.

In woods, Quebec to Alaska, south to South Carolina, Kansas and Washington. Ascends to 5000 ft. in North Carolina. May–Aug.

2. Hydrophyllum macrophýllum Nutt. Large-leaved Water-leaf. (Fig. 2997.)

Hydrophyllum macrophyllum Nutt. Journ. Phila. Acad. 7: 111. 1834.

Perennial by scaly rootstocks, villous-hirsute all over; stem rather stout, 2°–3° high. Lower leaves long-petioled, 8′–12′ long, deeply pinnatifid or pinnately divided into 7–13 oval or ovate obtuse coarsely dentate segments 1′–3′ long; upper leaves similar, smaller, shorter-petioled and with fewer segments; cymes long-peduncled, simple or forked, very dense; peduncles stout; pedicels short; flowers nearly white; calyx cleft to below the middle, its lobes lanceolate, erect, white-hispid, the sinuses not appendaged; corolla 5″–6″ long; anthers oblong; capsule globose, densely white-hispid, about 1½″ in diameter, enclosed by the calyx.

In rich woods, Ohio to Alabama, west to Illinois and Tennessee. Ascends to 4000 ft. in Virginia.

3. Hydrophyllum appendiculàtum Michx. Appendaged Water-leaf. (Fig. 2998.)

Hydrophyllum appendiculatum Michx. Fl. Bor. Am. 1: 134. 1803.

Biennial, rough-hairy all over; stems slender, simple or usually branched, weak, 1°–2° long, somewhat viscid above. Lower and basal leaves long-petioled, pinnatifid or pinnately divided into 5–7 ovate or oval, acute or obtusish, irregularly dentate or incised, membranous segments; upper leaves smaller and shorter-petioled, ovate to orbicular, variously lobed, the lobes acute and dentate; cymes loose, branched, the slender pedicels 4″–10″ long; calyx parted to near the base, enlarging in fruit, the segments triangular-lanceolate, acuminate, spreading, with a short reflexed appendage in each sinus; corolla violet or purple, 6″–7″ long; stamens little exserted; capsule about 1½″ in diameter.

In woods, Ontario to North Carolina, west to Minnesota and Kansas. May–June.

4. Hydrophyllum Canadénse L. Broad-leaved Water-leaf. (Fig. 2999.)

H. Canadense L. Syst. Ed. 10, no. 1. 1759.

Perennial by scaly rootstocks; stems rather slender, commonly simple, glabrous or nearly so, 1°–2½° high. Leaves nearly orbicular, cordate, sparingly pubescent, at least above, palmately 5–9-lobed, the lower long-petioled, often 12′ broad, occasionally with 1 or 2 pairs of small segments on the petiole; upper leaves smaller, but usually 4′–7′ broad; lobes ovate, acuminate, dentate; peduncles shorter than the leaves; cymes dense or becoming loose, simple or forked; pedicels short, nearly glabrous; calyx cleft nearly to the base, its segments linear-lanceolate, acute, nearly or quite glabrous, sometimes with a minute tooth in each sinus; corolla campanulate-rotate, white to purplish anthers linear-oblong; capsule 2″ in diameter.

In woods, Massachusetts and southern New York to North Carolina, west to Illinois. Ascends to 4000 ft. in Virginia. June–Aug.

2. NEMÓPHILA Nutt. Journ. Phil. Acad. 2: 179. 1822.

Annual diffuse pubescent slender and fragile herbs, with alternate or opposite mostly pinnatifid or lobed leaves. Flowers white, blue, or variegated, solitary, peduncled, lateral or terminal. Calyx deeply 5-cleft or 5-parted, with a reflexed or spreading appendage in each sinus. Corolla campanulate or rotate-campanulate, mostly longer than the calyx, usually with 10 small appendages within at the base, the lobes convolute in the bud. Stamens included; anthers ovate or oblong. Ovary 1-celled with placentae similar to those of *Hydrophyllum;* styles partly united; ovules 2–12 on each placenta. Capsule 2-valved. Seeds 1–4 in our species. [Greek, grove-loving.]

About 10 species, natives of North America, mostly Californian.

1. Nemophila micrócalyx (Nutt.) F. & M. Small-flowered Nemophila. (Fig. 3000.)

Ellisia microcalyx Nutt. Trans. Am. Phil. Soc. (II.) 5: 191. 1833–37.
Nemophila microcalyx F. & M. Sert. Petrop. 1846.

Stems very slender, diffuse, branched, 2′–15′ long. Leaves membranous, petioled, 1′–2½′ long, pinnatifid or pinnately divided into 3–5 obovate cuneate or oblique obtuse 2–3-dentate or -lobed, approximate or confluent segments, the upper all alternate, the lowest opposite; peduncles slender, 4″–12″ long, opposite the leaves, shorter than or equalling the petioles; flowers white or blue, 1½″–2″ long; appendages in the sinuses of the calyx minute; calyx scarcely enlarged in fruit; ovules 2 on each placenta; corolla-appendages obsolete or none; anthers oval; capsule about 1½″ in diameter, much longer than the calyx, 1–2-seeded.

In woods, Virginia to Florida, west to Arkansas and Texas. April–June.

3. MACRÓCALYX Trew, Nov. Act. Nat. Cur. 2: 330–332. *pl. 7. f. 1.* 1761.

[Ellisia L. Sp. Pl. Ed. 2, 1662. 1763. Not Syst. Ed. 10. 1759.]

Annual hirsute or pubescent branching slender herbs, with opposite or alternate, pinnately divided or 1–3-pinnatifid leaves, and solitary or racemose small white or bluish flowers. Calyx 5-lobed or 5-parted, spreading, much enlarged in fruit, destitute of appendages in the sinuses. Corolla campanulate or nearly cylindric, shorter than or slightly exceeding the calyx, usually with 5 minute appendages on the tube within, its lobes convolute in the bud. Stamens included; anthers oval or oblong. Ovary 1-celled; styles united below; ovules 2–4 on each of the placentae, which are similar to those of the two preceding genera. [Greek, large calyx.]

About 3 species, natives of North America.

1. Macrocalyx Nyctèlea (L.) Kuntze. Nyctelea. (Fig. 3001.)

Ipomoea Nyctelea L. Sp. Pl. 160. 1753.
Polemonium (?) *Nyctelea* L. Sp. Pl. Ed. 2, 231. 1762.
Ellisia Nyctelea L. Sp. Pl. Ed. 2, 1662. 1763.
M. Nyctelea Kuntze, Rev. Gen. Pl. 434. 1891.

Sparingly hirsute-pubescent; stem several times forked, 4′–12′ high. Leaves pinnately divided, petioled, 2′–4′ long, ovate-oblong in outline, the upper alternate, the lower opposite, the segments oblong or lanceolate, dentate, entire or lobed; peduncles slender, 1-flowered, opposite the leaves; calyx in flower about 2″ long, about equalling the corolla, enlarging, widely spreading and becoming 8″–14″ broad in fruit, its lobes lanceolate or ovate-lanceolate, acuminate; fruit at length pendulous; capsule globose, 2″–3″ in diameter.

In moist soil, New Jersey to Minnesota and the Northwest Territory, south to Virginia, Nebraska and Missouri. April–July.

4. PHACÈLIA Juss. Gen. Pl. 127. 1789.

Annual or rarely perennial, mostly hirsute hispid or scabrous herbs, with alternate entire dentate lobed pinnatifid or dissected leaves, the lowest rarely opposite, and blue purple violet or white flowers in terminal scorpioid cymes or racemes. Calyx 5-lobed, somewhat enlarging in fruit; sinuses not appendaged. Corolla campanulate, nearly rotate, tubular or funnelform, the tube sometimes appendaged within, opposite the lobes, the lobes imbricated in the bud. Stamens exserted or included, attached near the base of the corolla; anthers mostly ovate. Ovary 1-celled, the 2 placentae narrow, affixed to the walls; styles united below; ovules 2 or several on each placenta. Capsule 1-celled, or falsely nearly 2-celled by the intrusion of the placentae, 2-valved. Seeds usually reticulated. [Greek, a cluster, referring to the clustered flowers of some species.]

About 80 species, natives of the New World. Besides the following, some 50 others occur in the western parts of North America.

Corolla-lobes entire.
- Corolla manifestly appendaged within, between the stamens.
  - Leaves entire. — 1. *P. leucophylla.*
  - Leaves crenate-dentate. — 2. *P. integrifolia.*
  - Leaves pinnately divided, or pinnatifid, the segments incised.
    - Racemes loose; pedicels slender; ovules 2 on each placenta. — 3. *P. bipinnatifida.*
    - Racemes dense; pedicels short; ovules numerous. — 4. *P. Franklinii.*
- Appendages of the corolla inconspicuous or none.
  - Filaments pubescent; calyx-lobes oblong.
    - Puberulent; flowers 4″–5″ broad. — 5. *P. dubia.*
    - Hirsute; flowers 6″–7″ broad. — 6. *P. hirsuta.*
  - Filaments glabrous; calyx-lobes linear. — 7. *P. Covillei.*

Corolla nearly rotate, its lobes fimbriate.
- Lobes of the leaves and calyx acute. — 8. *P. Purshii.*
- Lobes of the leaves and calyx obtuse. — 9. *P. fimbriata.*

1. Phacelia leucophýlla Torr. Silky Phacelia. (Fig. 3002.)

Phacelia leucophylla Torr. Frem. Rep. 93. 1845.

Perennial by a stout rootstock, pale, densely silky-pubescent, the hairs appressed or ascending. Stem simple or branched, 1°–1½° high; leaves lanceolate to oblong, entire, pinnately veined, 2′–4′ long, 4″–12″ wide, the lower long-petioled, the upper sessile or nearly so; spike-like branches of the scorpioid cymes very dense, nearly straight and 1′–3′ long when expanded; flowers sessile, very numerous, about 4″ high; calyx-lobes hispid, oblong-lanceolate or linear, somewhat shorter than the white or bluish, 5-lobed corolla; corolla-appendages conspicuous, in pairs between the filaments; filaments exserted glabrous; ovules 2 on each placenta; capsule ovoid.

In dry soil, South Dakota to Idaho and western Nebraska. May–Aug. The species has been taken for *P. heterophylla* Pursh, of the far west, which has spreading brown hairs, some of the leaves usually pinnatifid, and pilose filaments.

2. Phacelia integrifòlia Torr. Crenate-leaved Phacelia. (Fig. 3003.)

P. integrifolia Torr. Ann. Lyc. N. Y. 2: 222. *pl. 3.* 1827.

Annual or biennial; stem erect or ascending, rather stout, very leafy, commonly branched above, viscid-hirsute, 6′–2° high. Leaves finely strigose-pubescent, ovate-oblong or oblong-lanceolate, irregularly crenate-dentate, obtuse at the apex, rounded or cordate at the base, 1′–2½′ long, petioled or the uppermost sessile; spike-like branches of the scorpioid cymes dense, 2′–4′ long when expanded; flowers sessile, about 4″ long; calyx-segments oblong, acute; corolla tubular-campanulate, white or blue, its tube longer then the calyx; filaments glabrous, exserted; ovules 2 on each placenta; capsule ovoid, obtuse.

In saline soil, western Kansas (according to B. B. Smyth), Colorado to Mexico, Utah and Arizona. April–Sept.

3. Phacelia bipinnatífida Michx. Loose-flowered Phacelia. (Fig. 3004.)

Phacelia bipinnatifida Michx. Fl. Bor. Am. 1: 134. *pl. 16.* 1803.

Biennial, hirsute-pubescent; stem erect, usually much branched, glandular-viscid above, 1°–2° high. Leaves slender-petioled, 2′–5′ long, pinnately divided or deeply pinnatifid into 3–7 ovate or oblong acute or acutish, dentate or incised segments, or these again pinnatifid; flowers blue or violet, 6″–8″ broad, numerous, slender-pedicelled in loose racemes, the inflorescence only slightly scorpioid; pedicels 4″–10″ long, recurved in fruit; calyx-segments linear; appendages of the rotate-campanulate corolla in pairs between the stamens, conspicuous, villous on the margins; filaments pilose, exserted; ovules 2 on each placenta; capsule globose.

In moist thickets and along streams, Ohio to Illinois, south to Alabama. Ascends to 4000 ft. in North Carolina. April–June.

4. Phacelia Franklínii (R. Br.) A. Gray. Franklin's Phacelia. (Fig. 3005.)

Eutoca Franklinii R. Br. App. Frank. Journ. 51. *pl. 27.* 1823.
Phacelia Franklinii A. Gray, Man. Ed. 2, 329. 1856.

Annual, villous-pubescent; stem erect, 6′–18′ high, simple, or corymbosely branched at the summit. Leaves 1½′–3′ long, pinnately parted into 7–15 linear or linear-oblong acute entire dentate or incised segments; flowers blue or nearly white, short-pedicelled in dense scorpioid racemes; calyx-segments linear-lanceolate, acute; longer than the tube of the rotate-campanulate corolla; appendages of the corolla free at the apex; anthers scarcely exserted; filaments glabrous, or nearly so; styles united nearly to the summit; ovules numerous on each placenta; capsule ovoid, acute.

Western Ontario and Minnesota to British Columbia and Idaho. Summer.

5. Phacelia dùbia (L.) Small. Small-flowered Phacelia. (Fig. 3006.)

Polemonium dubium L. Sp. Pl. 1753.
Phacelia parviflora Pursh, Fl. Am. Sept. 140. 1814.
Phacelia dubia Small, Bull. Torr. Club, 21: 303. 1894.

Annual, puberulent or glabrate, branched from the base, the branches very slender, erect or ascending, 5′–12′ high. Lower and basal leaves petioled, 1′–2′ long, pinnatifid or pinnately divided into 3–5 oblong obtuse entire or dentate segments, or rarely merely dentate, or even entire; upper leaves much smaller, sessile, less divided; flowers light blue or white, racemose, 4″–5″ broad; racemes 5–15-flowered, elongated in fruit; pedicels 3″–7″ long; calyx-lobes oblong or oblong-lanceolate; corolla rotate-campanulate, the appendages obsolete; filaments pubescent; anthers slightly exserted; ovules 4–8 on each placenta; capsule globose, 1½″ in diameter, 6–12-seeded; fruiting pedicels ascending.

In moist soil, Pennsylvania to Georgia, Kansas and Texas. Ascends to 2000 ft. in Virginia. April–June.

7. Phacelia Covillei S. Wats. Coville's Phacelia. (Fig. 3008.)

Phacelia Covillei S. Wats. in A. Gray, Man. Ed. 6, 360. 1890.

Annual, similar to the two preceding species, branched from the base, pubescent; branches very slender, weak, 6′–12′ long. Leaves deeply pinnatifid or pinnately divided into 3–7 oblong or obovate, obtuse segments; racemes only 1–5-flowered; pedicels filiform, 6″–18″ long; calyx-segments linear, elongating in fruit; corolla tubular-campanulate, about 3″ long and broad when expanded; filaments glabrous; anthers not exserted; appendages of the corolla obsolete; capsule globose, 1½″–2″ in diameter; fruiting pedicels recurved.

Along the Potomac River above Washington, D. C. April–May.

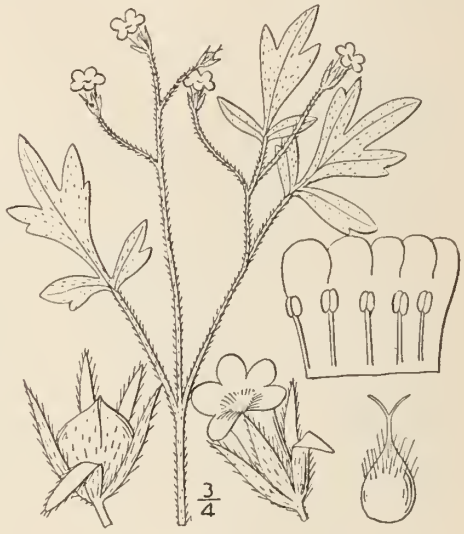
6. Phacelia hirsùta Nutt. Hairy Phacelia. (Fig. 3007.)

Phacelia hirsuta Nutt. Trans. Am. Phil. Soc. (II.) 5: 191. 1834–37.

Phacelia parviflora var. *hirsuta* A. Gray, Proc. Am. Acad. 10: 321. 1875.

Similar to the preceding species but usually stouter and larger, hirsute-pubescent. Leaves petioled, pinnatifid or deeply pinnately divided into 5–9 oblong obtuse usually entire segments, or the upper 3–5-lobed or entire, sessile; racemes rather dense, scorpioid when unfolding; flowers blue, 6″–7″ broad; calyx-segments oblong-lanceolate, hirsute; corolla rotate-campanulate, its appendages short; ovules 3–4 on each placenta; stamens scarcely exserted; capsule globose, 4–8-seeded.

In dry soil, Virginia to Georgia, west to Missouri and Texas. April–June.



8. Phacelia Púrshii Buckl. Pursh's Phacelia. (Fig. 3009.)

Phacelia Purshii Buckl. Am. Journ. Sci. 45: 171. 1843.

Annual, pubescent; stem erect, usually much branched, 6′–18′ high. Lower and basal leaves petioled, 1½′–3′ long, pinnately parted or pinnatifid into 9–15 oblong or lanceolate, acute or obtusish, entire or sometimes incised segments; upper leaves sessile, with fewer segments; racemes strongly 1-sided, 10–20-flowered, much elongated in fruit; pedicels 3″–12″ long; calyx-segments lanceolate or linear-lanceolate; corolla 5″–6″ broad, blue or white, nearly rotate, not appendaged within, its lobes fimbriate; filaments slightly exceeding the corolla; ovules 2 on each placenta; capsule globose-ovoid.

In moist woods or thickets, Pennsylvania to Minnesota, south to North Carolina, Alabama and Missouri. Ascends to 2000 ft. in Virginia. April–June.

9. Phacelia fimbriàta Michx. Fringed or Mountain Phacelia. (Fig. 3010.)

Phacelia fimbriata Michx. Fl. Bor. Am. 1:134. 1803.

Annual, sparingly pubescent; stems simple or branched, ascending or diffuse, 6′–20′ long. Basal and lower leaves slender-petioled, 2′–4′ long, pinnately divided into 5–9 orbicular obovate or oblong obtuse dentate or entire segments; upper leaves sessile, their segments oblong or lanceolate, acute; clusters loose, 3–12-flowered; pedicels 4″–15″ long; flowers 4″–5″ broad, white; calyx-segments linear to spatulate, obtuse; corolla rotate-campanulate, not appendaged within, its lobes strongly fimbriate; filaments pilose, about equalling the corolla; ovules 2 on each placenta; capsule depressed-globose, 2″ in diameter.

In woods, mountains of Virginia to Alabama. May–June.

5. NÀMA L. Sp. Pl. 226. 1753.

[HYDROLEA L. Sp. Pl. Ed. 2, 328. 1762.]

Perennial herbs, some tropical species shrubby, with alternate entire leaves, sometimes with spines in their axils, and blue cymose-clustered or racemose flowers. Calyx-segments distinct to the base, ovate or lanceolate. Corolla rotate-campanulate, not appendaged within, 5-cleft, the lobes imbricated in the bud. Stamens inserted on the base of the corolla; filaments filiform, dilated below; anthers sagittate. Ovary 2-celled (rarely 3-celled); ovules numerous in each cavity, on fleshy adherent placentae; styles 2, rarely 3, slender or filiform, distinct to the base; stigma capitellate. Capsule globose or ovoid, septicidally or irregularly dehiscent. [Greek, a stream, referring to the habitat.]

About 15 species, natives of warm and tropical regions of both the Old World and the New. Besides the following, another occurs in the southern United States.

Leaves lanceolate; flowers mostly in axillary clusters.
  Glabrous, or very nearly so, throughout; sepals ovate to ovate-lanceolate. 1. *N. affinis.*
  Villous, at least above, and on the calyx; sepals lanceolate. 2. *N. quadrivalvis.*
Leaves ovate; flowers mostly in terminal clusters; sepals villous. 3. *N. ovata.*

1. Nama affinis (A. Gray) Kuntze. Smooth Nama. (Fig. 3011.)

Hydrolea affinis A. Gray, Man. Ed. 5, 370. 1867.

Nama affinis Kuntze, Rev. Gen. Pl. 435. 1891.

Glabrous or very nearly so throughout, with or without slender spines in the axils; stems ascending, 1°–2½° high. Leaves oblong-lanceolate, petioled, acute or acuminate at both ends, 2′–5′ long, 4″–8″ wide; flowers 6″–7″ broad, short-pedicelled, in rather dense peduncled leafy-bracted axillary clusters; sepals ovate, or ovate-lanceolate, acute or acuminate, about equalling the corolla; capsule 2″ in diameter when mature, somewhat longer than the styles, shorter than the sepals.

In wet places, southern Illinois to Missouri, Louisiana and Texas. June–Aug.

2. **Nama quadrivàlvis** (Walt.) Kuntze. Hairy Nama. (Fig. 3012.)

Hydrolea quadrivalvis Walt. Fl. Car. 110. 1788.
Hydrolea Caroliniana Michx. Fl. Bor. Am. 1: 177. 1803.
Nama quadrivalvis Kuntze, Rev. Gen. Pl. 435. 1891.

Similar to the preceding species, but pubescent, at least above, and on the calyx, with spreading hairs, usually bearing slender spines in the axils; stem ascending, 1°–2° high. Leaves lanceolate, acute or acuminate, glabrous, or sparingly pubescent, petioled, 2′–5′ long, 3″–8″ wide; lower petioles ½′ long, or more; flowers in axillary clusters; sepals lanceolate, or linear-lanceolate, acuminate, about as long as the corolla; capsule 2″–3″ in diameter, longer than the styles, about the length of the sepals.

In wet soil, southeastern Virginia to Florida and Louisiana. June–Aug.

3. **Nama ovàta** (Nutt.) Britton. Ovate-leaved Nama. (Fig. 3013.)

Hydrolea ovata Nutt. Trans. Am. Phil. Soc. (II.) 5: 196. 1833–37.
N. ovata Britton, Mem. Torr. Club, 5: 272. 1894.

Stem erect or nearly so, 1°–3° high, usually branched near the summit, puberulent, or somewhat hirsute, at least above, usually spine-bearing in most of the axils. Leaves ovate, rarely ovate-lanceolate, puberulent, or glabrous, short-petioled, or the upper almost sessile, 1′–2½′ long, ½′–1¼′ wide, acute at the apex, narrowed or rounded at the base; flowers in terminal clusters, often 1′ broad, or more; sepals lanceolate, acuminate, very villous, shorter than the corolla, longer than the capsule; styles longer than the sepals.

In wet soil, Georgia to Missouri, Louisiana and Texas. May–Sept.

Family 23. **BORAGINÀCEAE** Lindl. Nat. Syst. Ed. 2, 274. 1836.

Borage Family.

Annual biennial or perennial herbs, shrubs, or some tropical species trees. Leaves alternate, very rarely opposite or verticillate, exstipulate, mostly entire and hispid, pubescent, scabrous or setose. Flowers perfect, usually regular, mostly blue, in one-sided scorpioid spikes, racemes, cymes, or sometimes scattered. Calyx inferior, mostly 5-lobed, 5-cleft, or 5-parted, usually persistent. Corolla gamopetalous, mostly regular and 5-lobed, sometimes crested or appendaged in the throat, rarely irregular, its lobes imbricated, convolute, plicate or induplicate in the bud. Stamens as many as the corolla-lobes and alternate with them, inserted on the tube or throat; filaments slender or short; anthers 2-celled, the sacs longitudinally dehiscent. Disk annular, entire, or 5-lobed, or none, commonly inconspicuous. Ovary superior, of 2 2-ovuled carpels, entire, or the carpels commonly deeply 2-lobed, making it appear as of 4 1-ovuled carpels; style simple, entire or 2-cleft in our genera; ovules anatropous or amphitropous. Fruit mostly of 4 1-seeded nutlets, or of 2 2-seeded carpels. Endosperm fleshy,

copious, or none; embryo straight or curved; cotyledons mostly flat or plano-convex; radicle short.

About 85 genera and 1500 species, of wide geographic distribution.

* Ovary entire or 2-4-grooved; style terminal. 1. *Heliotropium.*

* * Ovary 4-divided or deeply 4-lobed, the style arising from the center.

Flowers regular.
- Nutlets armed with barbed prickles.
  - Nutlets spreading or divergent, covered by the prickles. 2. *Cynoglossum.*
  - Nutlets erect or incurved, the prickles on their backs or margins. 3. *Lappula.*
- Nutlets unarmed.
  - Nutlets attached laterally to the receptacle, sometimes just above their bases.
    - Fruiting calyx not greatly enlarged nor membranous.
      - Corolla small, usually white; receptacle conic or elongated.
        - Annuals; calyx nearly closed in fruit; inflorescence naked or bracteolate.
          - Lowest leaves mostly opposite; calyx persistent. 4. *Allocarya.*
          - Leaves all alternate; calyx at length deciduous. 5. *Cryptanthe.*
        - Perennials or biennials; calyx-segments more or less spreading in fruit; inflorescence leafy. 6. *Oreocarya.*
      - Corolla tubular-funnelform, mostly blue; receptacle flat or convex.
        - Maritime; nutlets fleshy, smooth and shining. 7. *Pneumaria.*
        - Not maritime; nutlets wrinkled when mature and dry. 8. *Mertensia.*
    - Fruiting calyx much enlarged, membranous, veiny. 9. *Asperugo.*
  - Nutlets attached to the receptacle by their very bases.
    - Scar of attachment small, flat.
      - Corolla salverform or funnelform, its lobes rounded, spreading.
        - Racemes not bracted; corolla-tube short. 10. *Myosotis.*
        - Racemes bracted; corolla-tube cylindric, usually slender. 11. *Lithospermum.*
      - Corolla tubular, its lobes erect, acute. 12. *Onosmodium.*
    - Scar of attachment large, concave.
      - Corolla tubular, 5-toothed. 13. *Symphytum.*
      - Corolla rotate; anthers erect in a cone. 14. *Borago.*

Flowers irregular.
- Stamens included; throat of the corolla closed by scales. 15. *Lycopsis.*
- Stamens exserted; throat of the corolla dilated, open. 16. *Echium.*

1. HELIOTRÒPIUM L. Sp. Pl. 130. 1753.

Herbs or shrubs, with alternate mostly entire and petioled leaves, and small blue or white flowers, in scorpioid spikes, or scattered. Calyx-lobes or -segments lanceolate or linear. Corolla salverform or funnelform, naked in the throat, its tube cylindric, its lobes imbricated, plicate or induplicate in the bud, spreading in flower. Stamens included; filaments short, or none. Style terminal, short or slender; stigma conic or annular. Fruit 2-4-lobed, separating into 4 1-seeded nutlets, or into 2, 2-seeded carpels. Ovary entire, or 2-4-grooved. [Greek, sun-turning, *i. e.*, turning to or with the sun.]

About 115 species, widely distributed in warm-temperate and tropical regions. Besides the following, some 9 others occur in the southern and western parts of North America. The species are called Turnsole.

Fruit 4-lobed, each lobe becoming a 1-seeded nutlet.
- Flowers in scorpioid spikes.
  - Plant rough-puberulent; leaves oval. 1. *H. Europaeum.*
  - Glabrous, fleshy; leaves linear or spatulate. 2. *H. Curassavicum.*
- Flowers solitary, terminating short branches. 3. *H. tenellum.*

Fruit 2-lobed, or of 2 carpels.
- Style elongated; flowers large, scattered, white. 4. *H. convolvulaceum.*
- Style very short; flowers blue, in scorpioid spikes. 5. *H. Indicum.*

1. Heliotropium Europaèum L. European Heliotrope. (Fig. 3014.)

Heliotropium Europaeum L. Sp. Pl. 130. 1753.

Annual, much branched, rough-puberulent, 6′–18′ high. Leaves oval, 1′–2′ long, obtuse at the apex, narrowed at the base, slender-petioled, pinnately veined; flowers white, 1″–2″ broad, in dense 1-sided scorpioid, bractless spikes; terminal spikes in pairs, the lateral ones commonly solitary, becoming 1′–3′ long in fruit; calyx-segments lanceolate to linear-lanceolate, shorter than the corolla-tube; anthers distinct, obtuse; stigma-tip long-conic; fruit depressed-globose, pubescent, 4-lobed, at length separating into 4 nutlets.

In waste places, southern New York and Pennsylvania to Florida. Adventive or naturalized from Europe. June–Oct.

2. Heliotropium Curassávicum L. Sea-side Heliotrope. (Fig. 3015.)

Heliotropium Curassavicum L. Sp. Pl. 130. 1753.

Annual (or southward perennial?), fleshy, glabrous throughout, more or less glaucous, branched, diffuse, the branches 6′–18′ long. Leaves oblanceolate, linear, linear-oblong, or spatulate, entire, very inconspicuously veined, 1′–2′ long, 1½″–3″ wide, obtuse at the apex, narrowed into petioles, or the upper sessile, sometimes with smaller ones fascicled in the axils; scorpioid spikes densely flowered, bractless, mostly in pairs; flowers about 2″ broad; calyx-segments lanceolate, acute; corolla white with a yellow eye or changing to blue; stigma umbrella-shaped; anthers acuminate; fruit globose, at length separating into 4 nutlets.

On sandy seashores, Virginia to Texas and Mexico. In dry saline soil from Manitoba and the Northwest Territory to Nebraska and Texas. On the Pacific Coast from Oregon to Mexico. Widely distributed in saline and maritime soil in South America and the Old World. In ballast about the northern seaports. May–Sept.

3. Heliotropium tenéllum (Nutt.) Torr. Slender Heliotrope. (Fig. 3016.)

Lithospermum tenellum Nutt. Trans. Am. Phil. Soc. (II.) 5: 188. 1833–37.
H. tenellum Torr. in Marcy's Rep. 304. *pl. 14.* 1853.

Annual, strigose-canescent; stem erect, slender, paniculately branched, commonly leafless below, 6′–18′ high. Leaves linear, entire, ½′–1½′ long, 1″–2″ wide, narrowed at both ends, sessile, or the lower petioled; flowers white, about 2½″ long, sessile at the ends of short lateral branches, bracted by 1 or 2 leaves; calyx-segments unequal, the 2 or 3 larger ones about as long as the corolla; corolla-tube canescent, slightly longer than the limb, its lobes entire; anthers obtuse; stigma subulate-tipped; fruit depressed, 4-lobed, strigose-pubescent, separating into 4 1-seeded nutlets.

In dry soil, Kentucky to Kansas, south to Alabama, Texas and New Mexico. April–Aug.

4. Heliotropium convolvulàceum (Nutt.) A. Gray. Bindweed Heliotrope. (Fig. 3017.)

Euploca convolvulacea Nutt. Trans. Am. Phil. Soc. (II.) 5: 189. 1833–37.
H. convolvulaceum A. Gray, Mem. Am. Acad. 6: 403. 1857.

Annual, strigose-canescent, usually much branched, 6′–15′ high, the branches ascending. Leaves oblong, ovate, or lanceolate, entire, short-petioled, obtuse or acute at the apex, narrowed at the base, ½′–1½′ long; flowers numerous, fragrant, very short-peduncled, terminal and lateral, mostly solitary and opposite the leaves; calyx-segments lanceolate, acuminate, equal; corolla white, strigose, 8″–10″ long, about 6″ broad, its tube narrowed at the throat, longer than the calyx and the angulate-lobed limb; anthers inserted on the tube of the corolla, slightly cohering by their tips; style filiform; stigma with a tuft of bristly hairs; fruit 2-lobed, pubescent, each lobe splitting into 2 1-seeded nutlets.

In dry sandy soil, Nebraska to Texas, Utah, and Mexico. July–Sept.

5. Heliotropium Índicum L. Indian Heliotrope. (Fig. 3018.)

Heliotropium Indicum L. Sp. Pl. 134. 1753.

Annual, more or less hirsute or hispid; stem commouly branched, 1°–3° high. Leaves ovate or oval, obtuse or acute at the apex, obtuse rounded or subcordate at the base, 2′–6′ long, 1′–3½′ wide, repand or undulate, borne on margined petioles ½′–2½′ long; flowers blue, 2″–3″ broad, sessile in terminal deuse bractless usually solitary scorpioid spikes which become 3′–6′ long in fruit; calyx-segments lauceolate, acute, shorter than the strigose corolla-tube; style very short, deciduous; fruit deeply 2-lobed, glabrous, the lobes divergent, each finally splitting into 2 nutlets, each of which is ribbed on the back.

In waste places, North Carolina to Illinois, south to Florida and Texas. Naturalized from India. Also in ballast about the northern seaports. Widely distributed in warm regions as a weed. May–Nov.

2. CYNOGLÓSSUM L. Sp. Pl. 134. 1753.

Hirsute or hispid (rarely glabrous) mostly tall herbs, with alternate entire leaves, the basal long-petioled, and purple blue or white flowers iu panicled, more or less scorpioid racemes. Calyx 5-cleft or 5-parted, enlarged and spreading or reflexed in fruit. Corolla funnelform or salverform, the tube short, the throat closed by 5 scales opposite the imbricated rounded lobes. Stamens included; filaments short; anthers ovate or oblong. Ovary deeply 4-lobed, separating into 4 diverging nutlets in fruit; style mostly slender. Nutlets oblique, flat or convex above, attached laterally to the convex or conic receptacle, covered with short barbed prickles. [Greek, dog's tongue.]

About 75 species of wide geographic distribution. Besides the following, some 3 others occur in western North America.

Stem leafy to the top; flowers reddish, purple or white; nutlets flat. 1. *C. officinale.*
Stem leafless above; flowers blue; nutlets convex. 2. *C. Virginicum.*

1. Cynoglossum officinàle L. Hound's-tongue. Gipsy Flower. (Fig. 3019.)

Cynoglossum officinale L. Sp. Pl. 134. 1753.

Biennial, pubescent; stem erect, leafy to the top, stout, usually brauched, 1½°–3° high. Basal and lower leaves oblong or oblong-lanceolate, slender-petioled, sometimes obtuse, 6′–12′ long, 1′–3′ wide; upper leaves lanceolate, acute or acuminate, sessile, or the uppermost clasping; racemes several or uumerous, bractless or sparingly bracted, simple or branched, much elongated in fruit; pedicels 3″–6″ long; calyx-segments ovate-lanceolate, acute; corolla reddish-purple or rarely white, about 4″ broad; fruit pyramidal, about 5″ broad, each of the 4 uutlets forming a side of the pyramid, flat on their upper faces, margined, splitting away at maturity, but hanging attached to portions of the subulate style.

In fields and waste places, Quebec and Ontario to Minnesota, south to North Carolina and Kansas. Often a troublesome weed. Naturalized from Europe. Native also of Asia. Called also Dog's-tongue, Rose Noble. May–Sept.

2. Cynoglossum Virginicum L. Wild Comfrey. (Fig. 3020.)

Cynoglossum Virginicum L. Sp. Pl. 134. 1753.

Perennial, hirsute; stem usually simple, leafless above, stout, 1½°–2½° high. Basal and lower leaves oval or oblong, 4′–12′ long, obtuse at the apex, narrowed into petioles; upper leaves oblong, or ovate-lanceolate, sessile and clasping by a cordate base, acute, nearly as large, or the one or two uppermost quite small; racemes 2–6, corymbose, bractless, long-peduncled; flowers blue, about 5″ broad; calyx-segments oblong-lanceolate, obtuse; fruit depressed, 4″ broad, the nutlets convex on the upper face, not margined, separating and falling away at maturity.

In woods, New Brunswick to western Ontario, south to Florida, Louisiana and Kansas. Ascends to 2500 ft. in Virginia. April–May.

3. LÁPPULA Moench, Meth. 416. 1794.

[Echinospermum Sw.; Lehm. Asperif. 113. 1818.]

Annual or perennial rough-pubescent or canescent erect branching herbs, with alternate narrow entire leaves, and small or minute blue or white flowers, in terminal bracted or bractless racemes. Calyx deeply 5-cleft or 5-parted, the segments narrow. Corolla salverform or funnelform, the tube very short, the throat closed by 5 scales, the lobes obtuse, spreading, imbricated in the bud. Stamens included; filaments very short. Ovary 4-lobed; style short. Nutlets 4, erect or incurved, laterally attached to the receptacle, at length separating, the margins or backs armed with stout often flattened barbed prickles, the sides usually papillose or tuberculate. [Diminutive of the Latin *lappa*, a bur.]

About 40 species, mostly natives of the north temperate zone. Besides the following, several others occur in western North America.

Racemes bracted; fruiting pedicels not deflexed.
- Prickles in 2 rows on the margins of the nutlets, distinct. — 1. *L. Lappula.*
- Prickles in 1 row on the margins, more or less confluent. — 2. *L. Texana.*

Racemes bracted only at the base; fruiting pedicels deflexed.
- Stem leaves ovate-oblong, the basal cordate; fruit globose. — 3. *L. Virginiana.*
- Leaves oblong, oblong-lanceolate or linear; fruit pyramidal.
  - Flowers 3″–5″ broad; fruit about 3″ broad. — 4. *L. floribunda.*
  - Flowers 1″–2″ broad; fruit about 2″ broad. — 5. *L. Americana.*

1. Lappula Láppula (L.) Karst. European Stickseed. Burseed. (Fig. 3021.)

Myosotis Lappula L. Sp. Pl. 131. 1753.
Lappula Myosotis Moench, Meth. 417. 1794.
Echinospermum Lappula Lehm. Asperif. 121. 1818.
Lappula Lappula Karst. Deutsch. Fl. 979. 1880–83.

Annual, pale, leafy, hispid or appressed-pubescent, branched, 1°–2° high, the branches erect. Leaves linear, linear-oblong or the lowest spatulate, sessile or the lower narrowed into petioles, ascending or erect, obtuse or obtusish at the apex, ½′–1½′ long; racemes leafy-bracted, more or less 1-sided; pedicels very short, stout, not deflexed in fruit; calyx-segments lanceolate, becoming unequal and spreading; corolla blue, about 1″ broad; fruit globose-oval, 1½″ in diameter; the nutlets papillose on the back, the margins armed with 2 rows of slender distinct prickles.

In waste places, Nova Scotia to British Columbia, south to New Jersey and Nebraska. Naturalized from Europe. Native also of Asia. May–Sept.

2. Lappula Texàna (Scheele) Britton. Hairy Stickseed. (Fig. 3022.)

Cynoglossum pilosum Nutt. Gen. 1. 114. 1818. Not R. & P. 1794.
E. Texanum Scheele, Linnaea, 25: 260. 1852.
Echinospermum Redowskii var. *cupulatum* A. Gray in Brewer & Wats. Bot. Cal. 1: 530. 1876.
Lappula Texana Britton, Mem. Torr. Club, 5: 273. 1894.

Annual, similar to the preceding species, 6′–2° high, paniculately branched, the branches ascending or erect. Leaves linear or linear-oblong, mostly obtuse, the lower narrowed into petioles; racemes leafy-bracted; pedicels short, not deflexed in fruit; flowers about 1″ broad; nutlets papillose-tuberculate on the back, the margins armed with a single row of flat, usually more or less confluent bristles, or these united into a cup.

In dry soil, Manitoba and the Northwest Territory to British Columbia, south to Nebraska, Texas and Arizona. Nutlets with nearly distinct bristles and others with bristles united into a cup sometimes occur on the same fruit. April–Aug.

3. Lappula Virginiàna (L.) Greene. Virginia Stickseed. (Fig. 3023.)

Myosotis Virginiana L. Sp. Pl. 131. 1753.
Cynoglossum Morisoni DC. Prodr. 10: 155. 1846.
E. Virginicum Lehm. Asperif. 120. 1818.
Lappula Virginiana Greene, Pittonia, 2: 182. 1891.

Biennial, pubescent; stem paniculately branched, 2°–4° high, the branches slender, spreading. Basal leaves (seldom present at flowering time) ovate or nearly orbicular, cordate, long-petioled, mostly obtuse; stem leaves ovate-oblong or oval, acute or acuminate at the apex, narrowed to the base, petioled, 3′–8′ long, 1′–4′ wide, the uppermost smaller, sessile; racemes very slender, divergent, bracted at the base, the bracts similar to the upper leaves; pedicels slender, short, recurved in fruit; corolla nearly white, about 1″ broad; fruit globose, nearly 2″ in diameter; nutlets covered on the margins and usually also on the back by the slender distinct flattened barbed prickles, the backs commonly also more or less papillose.

In dry woods and thickets, New Brunswick to western Ontario and Minnesota, Alabama, Louisiana and Nebraska. Called Beggar's-ticks or -lice. June–Sept.

4. Lappula floribúnda (Lehm.) Greene. Large-flowered Stickseed. (Fig. 3024.)

Echinospermum floribundum Lehm. in Hook. Fl. Bor. Am. 2: 84. *pl. 164.* 1834.
Lappula floribunda Greene, Pittonia, 2: 182. 1891.

Biennial or perennial, rough-pubescent; stem stout, paniculately branched, 2°–5° high, the branches nearly erect. Leaves oblong, oblong-lanceolate, or linear-lanceolate, 2′–4′ long, 2″–10″ wide, sessile, acute or obtuse at the apex, or the lower narrowed into petioles; racemes numerous, erect or nearly so, very densely flowered, bracted at the base, many of them in pairs; pedicels 2″–4″ long, reflexed in fruit; flowers blue, 3″–5″ broad; fruit pyramidal, about 3″ broad; nutlets keeled, papillose-tuberculate on the back, the margins armed with a single row of flat prickles, which are sometimes confluent at the base.

Western Ontario and Minnesota to British Columbia, south to New Mexico and California. June–Aug.

5. Lappula Americàna (A. Gray) Rydberg. Nodding Stickseed. (Fig. 3025.)

Echinospermum deflexum var. *Americanum* A. Gray, Proc. Am. Acad. 17: 224. 1882.

Lappula Americana Rydberg, Bull. Torr. Club, 24: 294. 1897.

Annual, rough-puberulent; stem slender, erect, paniculately branched, 1°–3° high, the branches spreading or ascending. Leaves oblong or oblong-lanceolate, mostly narrowed at both ends, 2′–4′. long, 2½″–6″ wide, the lower petioled, the upper sessile; racemes slender, many-flowered; pedicels slender, 2″–4″ long, deflexed in fruit; corolla white or bluish, about 1″ broad; fruit pyramidal, about 2″ broad; nutlets keeled, papillose-tuberculate on the back, rarely with a few prickles on the keel, the margins armed with a single row of flat prickles.

In thickets, Manitoba and North Dakota to British Columbia. Also in Europe and Asia. May–Aug.

4. ALLOCÀRYA Greene, Pittonia, 1: 12. 1887.

Mostly annual low herbs, with linear entire leaves, the lowest often opposite, and small flowers in terminal spikes or racemes. Pedicels thickened at the summit, persistent. Calyx 5-divided, persistent, the segments narrow. Corolla salverform, white, yellow in the throat. Stamens included. Ovary 4-divided; style short. Nutlets crustaceous, smooth, or rough, attached at their base or below the middle to the receptacle, the scar of attachment concave or raised. [Greek, different nuts.]

About 25 species, natives of western North America.

1. Allocarya scopulòrum Greene. Mountain Allocarya. (Fig. 3026.)

Eritrichium Californicum var. *subglochidiatum* A. Gray, Bot. Cal. 1: 526. In part. 1876.
Allocarya scopulorum Greene, Pittonia, 1: 16. 1887.

Somewhat succulent pubescent, with scattered stiff appressed hairs, branched, the slender spreading branches 1′–8′ long. Leaves 6″–18″ long, 1″–1½″ wide, sessile or very short-petioled, flowers about 1″ broad, distant, borne in most of the axils, very short-pedicelled; floral bracts similar to the leaves, but shorter; calyx segments linear-lanceolate; nutlets reticulate on the back, lightly grooved on the ventral side.

Western Nebraska to Montana, Wyoming and Colorado. June–Sept.

5. CRYPTÁNTHE Lehm. Sem. Hort. Hamburg. 1832.

[Krynitzkia F. & M. Ind. Sem. Hort. Petrop. 7: 52. 1841.]

Low annual setose or hispid branched herbs, with narrow alternate entire leaves, and small mostly white flowers, in scorpioid bractless or bracteolate spikes. Calyx 5-parted or 5-cleft, at length deciduous from the spike, the lobes or segments erect, mostly connivent in fruit. Corolla small, funnelform, usually with 5 scales closing the throat, the lobes imbricated in the bud. Stamens included; filaments short. Ovary 4-divided; style short; stigma capitellate. Nutlets erect, rounded on the back, not keeled, the margins obtuse, acute or wing-margined, attached laterally to the conic or elongated receptacle, the scar of attachment mostly longer than broad. [Greek, hidden-flowered.]

About 50 species, natives of North and South America, mostly of the western United States.

Nutlets, at least some of them, with short processes. 1. *C. crassisepala.*
All four nutlets smooth and shining. 2. *C. Fendleri.*

1. **Cryptanthe crassisépala** (T. & G.) Greene. Thick-sepaled Cryptanthe. (Fig. 3027.)

Eritrichium crassisepalum T. & G. Pac. R. R. Rep. 2. 171. 1854.
Krynitzkia crassisepala A. Gray, Proc. Am. Acad. 20: 268. 1885.
Cryptanthe crassisepala Greene, Pittonia, 1: 112. 1887.

Densely hispid, at length much branched, 3′–6′ high. Leaves linear, or linear-spatulate, ½′–1½′ long, sessile, or the lower narrowed into petioles; spikes very densely flowered; flowers about 2″ broad, sessile, bracteolate, the bractlets slightly longer than the calyx; fruiting calyx 3″ long, closing over the fruit, its segments linear, obtusish, their midribs much thickened; fruit of 3 finely muricate nutlets, and 1 larger smooth and shining nutlet about 1″ long, attached to the receptacle from the base to near the middle.

In dry soil, Northwest Territory to Nebraska, Kansas, Texas and New Mexico. June–Aug.

2. **Cryptanthe Féndleri** (A. Gray) Greene. Fendler's Cryptanthe. (Fig. 3028.)

Krynitzkia Fendleri A. Gray, Proc. Am. Acad. 20: 268. 1885.
Cryptanthe Fendleri Greene, Pittonia, 1: 120. 1887.

Erect, hispid; stem slender, paniculately branched, 6′–15′ high. Leaves linear, or the lowest linear-spatulate, 1′–2½′ long; spikes slender, bracteolate only at the base; flowers sessile, 1″–2″ broad; fruiting calyx nearly closed, its segments linear, leaf-like, herbaceous, about 2″ long; nutlets 4, all alike, brown, smooth and shining, less than 1″ long, attached to the receptacle from the base to about the middle.

In dry soil, Northwest Territory to Washington, south to Nebraska and Arizona. June–Aug

6. OREOCÀRYA Greene, Pittonia, 1: 57. 1887.

Perennial or biennial hispid or strigose-pubescent herbs, mostly with thick woody roots, alternate or basal narrow leaves, and small white racemose-paniculate or densely thyrsoid flowers. Calyx very deeply 5-parted or 5-divided, the segments lanceolate, more or less spreading or recurved in fruit. Corolla funnelform or salverform, mostly crested in the throat, 5-lobed. Stamens included. Ovary 4-divided; style mostly short. Nutlets 4, laterally attached to the receptacle, not keeled, their margins acute or winged. [Greek, mountain nut.]

About 9 species, natives of western North America and Mexico.

Inflorescence racemose-paniculate; nutlets smooth. — 1. *O. suffruticosa.*
Inflorescence thyrsoid or thyrsoid-glomerate; nutlets rough.
  Corolla-tube not longer than the calyx, little longer than the lobes.
    Densely rough-hairy, 6′–18′ high. — 2. *O. glomerata.*
    Silvery appressed-pubescent, 3′–6′ high. — 3. *O. sericea.*
  Corolla-tube longer than the calyx, 2 or 3 times as long as the lobes. — 4. *O. fulvocanescens.*

1. Oreocarya suffruticòsa (Torr.) Greene. Shrubby Oreocarya. (Fig. 3029.)

Myosotis suffruticosa Torr. Ann. Lyc. N. Y. 2: 225. 1827.
Eritrichium Jamesii Torr. in Marcy's Rep. 294. 1853.
Krynitzkia Jamesii A. Gray, Proc. Am. Acad. 20: 278. 1885.
Oreocarya suffruticosa Greene, Pittonia, 1: 57. 1887.

Perennial, rather stout, branched from the base and sometimes also above, strigose-pubescent or somewhat hirsute, 5′–12′ high. Upper leaves linear, ½′–1′ long, the lower oblanceolate, somewhat longer, obtuse or acute; racemes slender, paniculed; pedicels about 1″ long; calyx canescent and somewhat hispid, the segments slightly spreading, or erect in fruit; bractlets longer than the fruiting calyx; corolla 1½″–3″ broad; its tube about equalling the calyx; nutlets smooth, nearly 1″ long, shining, closely fitting together, triangular, acute-margined, nearly as wide as high.

In dry soil, western Nebraska and Wyoming to Texas and Arizona. May–Aug.

2. Oreocarya glomeràta (Pursh) Greene. Clustered Oreocarya. (Fig. 3030.)

Cynoglossum glomeratum Pursh, Fl. Am. Sept. 729. 1814.
Eritrichium glomeratum DC. Prodr. 10: 131. 1846.
Krynitzkia glomerata A. Gray, Proc. Am. Acad. 20: 279. 1885.
O. glomerata Greene, Pittonia, 1: 58. 1887.

Perennial or biennial, densely hispid; stem erect, stout, simple or branched, 6′–18′ high. Leaves spatulate or the upper linear, obtuse, 1′–2½′ long, the basal commonly tufted; inflorescence of thyrsoid clusters, the short dense lateral spike-like clusters mostly longer than the subtending bracts; calyx densely bristly; corolla 3″–5″ broad; fruit pyramidal, the nutlets triangular-ovate, acute, acutely margined, papillose on the back.

In dry soil, Manitoba to the Northwest Territory, south to Nebraska, New Mexico and Utah. May–Sept.

3. Oreocarya sericea (A. Gray) Greene. Low Oreocarya. (Fig. 3031.)

Eritrichium glomeratum var. *humile* A. Gray, Proc. Am. Acad. 10: 61. 1874. Not *E. humile* DC.
Krynitzkia sericea A. Gray, Proc. Am. Acad. 20: 279. 1885.
Oreocarya sericea Greene, Pittonia, 1: 58. 1887.

Perennial, low, tufted from the woody root; stems usually simple, 3′–6′ high, silvery appressed-pubescent, or hirsute above. Leaves linear-spatulate, ½′–1′ long, 1″–1½″ wide, obtuse or acutish, imbricated on the short sterile shoots and at the bases of the flowering stems; inflorescence thyrsoid or glomerate, usually short; calyx densely hispid; corolla 2″–3″ broad, its tube not longer than the calyx; style short; nutlets acutely margined, acute, papillose on the back.

In dry soil, Northwest Territory to Nebraska and Utah. May–Sept.

4. Oreocarya fulvocanéscens (A. Gray) Greene. Tawny Oreocarya. (Fig. 3032.)

Eritrichium fulvocanescens A. Gray, Proc. Am. Acad. 10: 61. 1874.
Eritrichium glomeratum var. (?) *fulvocanescens* S. Wats. Bot. King's Exp. 243. *pl. 23, f. 7.* 1871.
Oreocarya fulvocanescens Greene, Pittonia, 1: 58. 1887.

Perennial, tufted, similar to the preceding species but densely strigose or hirsute. Leaves spatulate, or oblanceolate, obtuse, the lower and basal ones 1′–1½′ long; inflorescence of thyrsoid clusters; calyx densely setose with yellowish hairs; corolla about 2″ broad, its tube longer than the calyx, 2 or 3 times the length of the lobes; style filiform; nutlets acutely margined, tuberculate on the back.

In dry soil, western Nebraska (according to Webber), Wyoming to Nevada and New Mexico. May–Aug.

7. PNEUMÀRIA Hill, Veg. Syst. 7: 40. *pl. 37.* 1764.

A perennial fleshy glabrous glaucous diffusely branched herb, with alternate entire leaves, and small blue pinkish or white flowers in loose terminal leafy-bracted racemes. Calyx-lobes triangular-ovate or lanceolate, somewhat enlarging in fruit. Corolla tubular-campanulate, crested in the throat, 5-lobed, the lobes imbricated in the bud, slightly spreading. Filaments scarcely exserted. Ovary 4-divided; style slender. Nutlets erect, fleshy, attached just above their bases to the somewhat elevated receptacle, smooth, shining, acutish-margined, becoming utricle-like when mature.

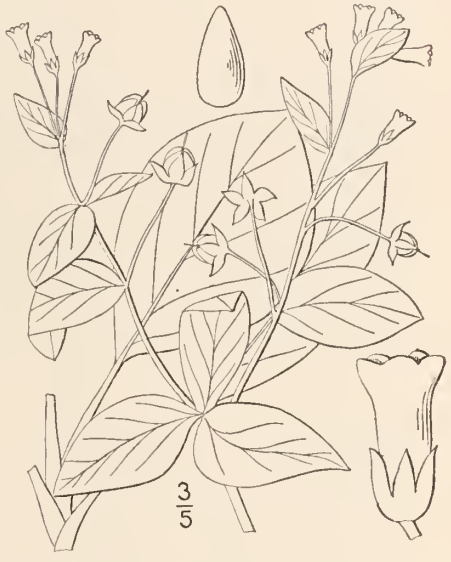
A monotypic genus of sea-beaches of the north temperate zone.

1. Pneumaria marítima (L.) Hill. Sea Lungwort. Sea Bugloss. Oyster Plant. (Fig. 3033.)

Pulmonaria maritima L. Sp. Pl. 136. 1753.
Pneumaria maritima Hill, Veg. Syst. 40. *pl. 37. f. 3.* 1764.
Mertensia maritima S. F. Gray, Nat. Arr. Brit. Pl. 354. 1821.

Pale green, the branches spreading or ascending, 3′–15′ long. Leaves thick, ovate, obovate, or oblong, 1′–4′ long, acute or obtuse at the apex, narrowed at the base, the lower and basal ones contracted into margined petioles, the uppermost smaller; flowers blue or nearly white, about 3″ long, all pedicelled; pedicels very slender, 5″–18″ long; calyx shorter than the corolla-tube; corolla with a crest in the throat opposite each lobe; nutlets about as long as the calyx-lobes when mature.

On sea-beaches, Long Island (?), Massachusetts to Newfoundland and Greenland, Oregon to Alaska. Also on the coasts of Europe and Asia. May–Sept.



8. MERTÉNSIA Roth, Catal. Bot. 1: 34. 1797.

Perennial glabrous or pubescent herbs, with alternate sometimes punctate leaves, and rather large blue purple or white flowers, in panicles, cymes, or racemes. Calyx-lobes lanceolate or linear, little enlarged in fruit. Corolla tubular-funnelform or trumpet-shaped, crested or unappendaged in the throat, its lobes obtuse, imbricated, little spreading. Stamens inserted on the tube of the corolla, included, or scarcely exserted; filaments flattened, or filiform; anthers oblong or linear, obtuse. Ovary 4-divided; style filiform. Nutlets erect, coriaceous, wrinkled when mature, attached above their bases to the convex or nearly flat receptacle. [In honor of Prof. C. F. Mertens, a German botanist.]

About 14 species, natives of the northern hemisphere. Besides the following, 3 others occur in the western part of North America. The species are called Smooth Lungwort.

Corolla trumpet-shaped, not crested in the throat, the limb barely 5-lobed. 1. *M. Virginica.*
Corolla funnelform-campanulate, crested in the throat, the limb manifestly 5-lobed.
  Stem-leaves ovate or ovate-lanceolate, acuminate. 2. *M. paniculata.*
  Stem-leaves oblong or lanceolate, obtuse or acute. 3. *M. lanceolata.*

1. Mertensia Virgínica (L.) DC. Virginia Cowslip. Tree Lungwort. Blue-bells. (Fig. 3034.)

Pulmonaria Virginica L. Sp. Pl. 135. 1753.
Mertensia Virginica DC. Prodr. 10: 88. 1846.

Glabrous; stem erect, or ascending, simple or sometimes branched, 1°–2° high, rather stout. Leaves oblong, oval, or obovate, pinnately veined, obtuse at the apex, 2′–5′ long, the uppermost sessile, the lower narrowed into margined petioles; racemes short, corymb-like; pedicels 2″–6″ long; flowers blue-purple, very showy, about 1′ long; calyx-lobes oblong-lanceolate, obtusish, 1″ long or less; corolla trumpet-shaped or nearly salverform, its tube cylindric, a little expanded above, longer than the 5-lobed plaited limb, pubescent at the base within, not crested in the throat; disk with two opposite linear lobes; filaments filiform, much longer than the anthers; nutlets not shining, rounded.

In low meadows and along streams, southern Ontario to New Jersey and South Carolina, Minnesota, Nebraska and Kansas. March–May.

2. Mertensia paniculàta (Ait.) Don. Tall Lungwort. (Fig. 3035.)

P. paniculata Ait. Hort. Kew. 1: 181. 1789.
Mertensia paniculata Don, Gen. Syst. 4: 318. 1838.

Roughish-pubescent, dark green; stem erect, branched above, 1½°–3° high, the branches slender. Leaves thin, pinnately veined, those of the stem ovate or ovate-lanceolate, acuminate at the apex, narrowed at the base, 2′–5′ long, the lower narrowed into slender petioles; basal leaves ovate, rounded or cordate at the base; racemes several-flowered, panicled; pedicels filiform, 4″–10″ long; flowers purple-blue, 6″–7″ long; calyx-lobes lanceolate, acute; corolla tubular-campanulate, crested in the throat, the tube about twice as long as the calyx and exceeding the 5-lobed limb; filaments flattened, slightly longer than the anthers; style filiform, usually somewhat exserted; nutlets rounded.

In woods or thickets, Hudson Bay to Alaska, south to Michigan, Nebraska, and in the Rocky Mountains to Colorado and Utah. July–Aug.

3. Mertensia lanceolàta (Pursh) DC. Lance-leaved Lungwort. (Fig. 3036.)

P. lanceolata Pursh, Fl. Am. Sept. 729. 1814.
Mertensia lanceolata DC. Prodr. 10: 88. 1846.

Glabrous or somewhat hirsute; stem simple or branched, slender, 6′–18′ high. Leaves papillose, indistinctly veined, light green, the upper lanceolate, acute, sessile or slightly clasping at the base, the lower oblong or oblanceolate, obtuse, 3′–4′ long, narrowed into margined petioles; racemes few-flowered, usually panicled; flowers blue, 5″–6″ long; pedicels 3″–7″ long; calyx-lobes lanceolate, obtuse, or acutish; corolla tubular-campanulate, the tube longer than the calyx and longer than the 5-lobed limb, hairy at the base within, the throat crested; filaments a little longer than the anthers; style filiform, scarcely exserted.

In thickets, western Nebraska to Manitoba, Wyoming and New Mexico. June–Aug.

9. ASPERÙGO L. Sp. Pl. 138. 1753.

Au annual rough-hispid procumbent herb, with alternate entire leaves, or the uppermost sometimes opposite, and small blue or nearly white flowers, short-pedicelled and 1–3 together in the upper axils. Calyx campanulate, unequally 5-cleft, much enlarged and folded together in fruit, the lobes incised-dentate. Corolla tubular-campanulate, 5-lobed, the lobes imbricated. Stamens 5, included, inserted on the corolla-tube; filaments very short. Ovary 4-divided; style short; stigma capitate. Nutlets 4, ovoid, erect, granular-tuberculate, keeled, laterally attached above the middle to the elongated-conic receptacle. [Latin, rough, referring to the leaves.]

A monotypic genus of Europe and Asia.

1. Asperugo procúmbens L. German Madwort. Catchweed. (Fig. 3037.)

Asperugo procumbens L. Sp. Pl. 138. 1753.

Stems slender, branched, diffusely procumbent, 6′–18′ long, very rough with stiff bristly hairs. Leaves oblong, lanceolate, or the lower spatulate, obtuse or acutish at the apex, ½′–1½′ long, the lower narrowed into margined petioles; flowers very short-pedicelled, about 1″ broad, blue, the pedicels recurved in fruit; fruiting calyx dry and membranous, strongly veined, 4″–6″ broad; nutlets obliquely ovoid.

In waste places and ballast, southern New York, New Jersey, Delaware and Pennsylvania. Also in Minnesota. Adventive from Europe. Called also Small Wild Bugloss and Great Goose-grass. May–Aug.

10. MYOSÒTIS L. Sp. Pl. 131. 1753.

Low annual biennial or perennial, more or less pubescent, branching, diffuse or erect herbs, with alternate entire leaves, and small blue pink or white flowers in many-flowered elongated bractless more or less 1-sided racemes, or these sometimes leafy at the base. Calyx 5-cleft, the lobes narrow, spreading or erect in fruit. Corolla salverform, the limb 5-lobed, the lobes convolute in the bud, rounded, the throat crested. Stamens 5, included, inserted on the corolla-tube; filaments filiform; anthers obtuse. Ovary 4-divided, style filiform. Nutlets erect, glabrous or pilose, attached by their bases to the receptacle, the scar of attachment small, flat. [Greek, mouse-ear.]

About 35 species of wide geographic distribution. Besides the following, 1 or 2 others occur in the southern and western parts of North America. Called Forget-me-not and Scorpion-grass.

Hairs of the calyx all straight; perennial swamp or brook plants.
- Calyx-lobes shorter than the tube; corolla 3″–4″ broad. 1. *M. palustris.*
- Calyx-lobes as long as the tube; corolla 2″–3″ broad. 2. *M. laxa.*

Hairs of the calyx, or some of them, with hooked tips; annuals or biennials.
- Fruiting pedicels longer than the calyx. 3. *M. arvensis.*
- Fruiting pedicels not longer than the calyx.
  - Calyx-lobes equal; corolla yellowish, changing to blue. 4. *M. versicolor.*
  - Calyx-lobes unequal; corolla white. 5. *M. Virginica.*

1. Myosotis palústris (L.) Lam. Forget-me-not. Mouse-ear Scorpion-grass. (Fig. 3038).

Myosotis scorpioides var. *palustris* L. Sp. Pl. 131. 1753.
Myosotis palustris Lam. Fl. Fr. 2: 283. 1778.

Appressed-pubescent, perennial, with slender rootstocks or stolons; stems slender, decumbent, rooting at the lower nodes, 6′–18′ long. Leaves oblong, oblanceolate or oblong-lanceolate, obtuse, narrowed at the base, 1′–3′ long, 2″–6″ wide, those of the stem sessile or very nearly so, or the lower petioled; racemes loosely many-flowered; pedicels longer than the calyx; calyx with straight appressed hairs, it lobes equal, triangular-ovate, acute, shorter than the tube, spreading in fruit; corolla blue with a yellow eye, the limb flat, 3″–4″ broad; nutlets angled and keeled on the inner side.

In brooks and marshes, Nova Scotia to southern New York and Pennsylvania. Escaped from cultivation. Native of Europe and Asia. Called also Marsh Scorpion-grass, Snake-grass and Love-me. May–July.

2. Myosotis láxa Lehm. Smaller Forget-me-not. (Fig. 3039.)

Myosotis laxa Lehm. Asperif. 83. 1818.
Myosotis palustris var. *laxa* A. Gray, Man. Ed. 5, 365. 1867.

Perennial, appressed-pubescent, similar to the preceding species; stems decumbent, spreading, rooting at the nodes, 6′–20′ long. Leaves oblong, oblong-lanceolate or spatulate, obtuse; racemes very loosely many-flowered; pedicels spreading, much longer than the fruiting calyx; hairs of the calyx straight, appressed, its lobes equal, ovate-lanceolate, acutish, spreading in fruit, quite as long as the tube; corolla blue with a yellow eye, its limb concave, about 2″ broad; nutlets convex on both the inner and outer sides.

In wet muddy places, Newfoundland to Ontario, south to Virginia and Tennessee. Also in Europe. Ascends to 3500 ft. in Virginia. May–July.

3. Myosotis arvénsis (L.) Lam. Field Scorpion-grass, or Mouse-ear. (Fig. 3040.)

Myosotis scorpioides var. *arvensis* L. Sp. Pl. 131. 1753.
Myosotis arvensis Lam. Fl. Fr. 2: 283. 1778.

Annual or biennial, hirsute-pubescent; stem erect, branched, 6′–18′ high. Basal and lower leaves oblanceolate, obtuse, petioled or sessile; stem leaves mostly oblong or oblong-lanceolate, obtuse or acutish at the apex, narrowed to the sessile base, ½′–1½′ long, 2″–4″ wide; racemes loosely flowered; fruiting pedicels longer than the calyx; hairs of the calyx, or some of them, with minutely hooked tips, the lobes equal, erect, or connivent in fruit, triangular-lanceolate, acute, about as long as the tube; corolla blue or white, the limb concave, 1″–1½″ broad; nutlets convex on the outer side, somewhat keeled on the inner.

In fields, New Brunswick to western Ontario and Minnesota, south to West Virginia. Perhaps not indigenous. Also in Europe. June–Aug.

4. Myosotis versícolor (Pers.) Reichenb. Yellow and Blue Scorpion-grass. (Fig. 3041.)

M. arvensis var. (?) *versicolor* Pers. Syn. 1: 156. 1805.
Myosotis versicolor Reichenb. Fl. Exc. 1: 341. 1830.
Smith, Engl. Bot. *t. 450?*

Annual, hirsute-pubescent, often much branched from the base, and sometimes also above; stems slender, erect or ascending, 4′–12′ high. Leaves oblong, obtuse or obtusish, sessile, or the lower spatulate and narrowed into margined petioles; racemes slender, sometimes bracted at the base; pedicels shorter than the fruiting calyx, erect; calyx equally 5-cleft, the lobes equal, linear-lanceolate, erect or connivent in fruit, longer than or equalling the tube, the hairs or some of them with minutely hooked tips; corolla pale yellow changing to violet or blue, its limb about 1″ broad; nutlets convex on the outer, slightly keeled on the inner side.

In fields and along roadsides, southern New York to Delaware. Naturalized from Europe. May–July.

5. Myosotis Virgínica (L.) B.S.P. Spring or Early Scorpion-grass. (Fig. 3042.)

Lycopsis Virginica L. Sp. Pl. 139. 1753.
Myosotis verna Nutt. Gen. 2: Add. 1818.
Myosotis Virginica B. S. P. Prel. Cat. N. Y. 37. 1888.

Annual or biennial, hirsute-pubescent or hispid, erect, branched, 3′–15′ high, the branches erect. Leaves oblong or linear-oblong, sessile, 3″–12″ long, obtuse, or the lower spatulate and narrowed into short petioles; racemes usually bracted at the base, strict; pedicels ascending or erect, or slightly spreading at the apex, shorter than the fruiting calyx; calyx somewhat 2-lipped, unequally 5-cleft, the lobes lanceolate, acute, longer than the tube, connivent in fruit, very hispid, the hairs, or most of them, with minutely hooked tips; corolla white, the limb 1½″ broad or less; nutlets convex on the back, slightly keeled and margined on the inner side.

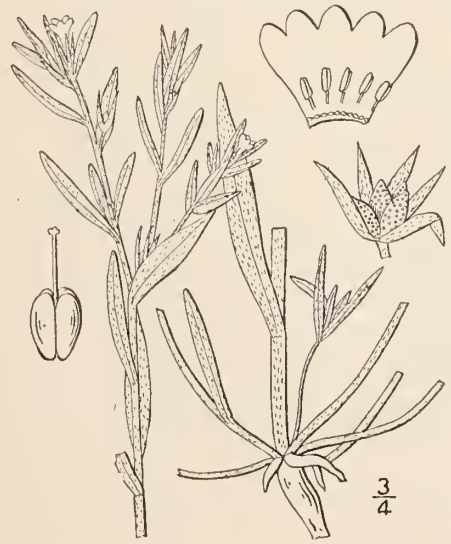
On dry hills and banks, Maine and southern Ontario to Minnesota, south to Florida and Texas. April–June.

11. LITHOSPÉRMUM L. Sp. Pl. 132. 1753.

Annual or perennial, erect branching or rarely simple, pubescent hirsute or hispid herbs, with alternate entire leaves, and small or large, white yellow or blue flowers in leafy-bracted spikes or racemes. Calyx 5-parted or 5-cleft, the segments or lobes narrow. Corolla funnelform or salverform, 5-lobed, naked, pubescent or crested in the throat, the lobes entire or erose-denticulate, the tube sometimes pubescent at the base within. Stamens 5, included, inserted on the throat of the corolla; filaments short. Ovary 4-divided; style slender, or filiform; stigma capitate, or 2-lobed. Nutlets 4, or fewer, erect, white, smooth and shining, or brown and wrinkled, attached by their bases to the nearly flat receptacle, the scar of attachment not concave. [Greek, stone-seed, from the hard nutlets.]

About 40 species, natives of the northern hemisphere, a few in South America and Africa. Besides the following, some 7 others occur in the southern and southwestern parts of the United States.

Corolla white or yellowish, its tube shorter than or equalling the calyx; flowers distant.
  Nutlets brown, wrinkled and pitted; annual or biennial. 1. *L. arvense.*
  Nutlets white, smooth and shining; perennials.
    Leaves lanceolate, acute; nutlets ovoid. 2. *L. officinale.*
    Leaves ovate, acuminate; nutlets globose-ovoid. 3. *L. latifolium.*
Corolla dull yellow, its tube longer than the calyx; leaves lanceolate; flowers dense. 4. *L. pilosum.*
Corolla bright yellow, its tube much longer than the calyx; flowers dense.
  Corolla-lobes entire; flowers all complete.
    Hispid-pubescent; corolla-tube bearded at the base within. 5. *L. Gmelini.*
    Hirsute, somewhat canescent; corolla-tube not bearded at the base within. 6. *L. canescens.*
  Corolla-lobes erose-denticulate; later flowers cleistogamous. 7. *L. angustifolium.*



1. Lithospermum arvénse L. Bastard Alkanet. Corn Gromwell. (Fig. 3043.)

Lithospermum arvense L. Sp. Pl. 132. 1753.

Annual or biennial, appressed-pubescent; stem erect, usually branched, 6′–20′ high. Leaves bright green, lanceolate, linear or linear-oblong, sessile or the lowest short-petioled, mostly appressed, obtuse or acutish at the apex, narrowed at the base, indistinctly veined, ½′–1½′ long, ½″–3″ wide, the uppermost smaller; flowers sessile or very nearly so in the spikes, becoming distant, white, about 3″ long; calyx-segments linear-lanceolate, longer than or equalling the corolla-tube; corolla funnelform, puberulent in the throat; nutlets brown, wrinkled and pitted, glabrous, about 1″ high, convex on the back, keeled on the inner side, one-third to one-half the length of the calyx-segments.

In waste places and fields, Quebec to Ontario and Michigan, south to Georgia and Kansas. Naturalized from Europe. Native also of Asia. Called also Pearl-plant and Salfern-stoneseed. May–Aug.

2. Lithospermum officinàle L. Gromwell. (Fig. 3044.)

Lithospermum officinale L. Sp. Pl. 132. 1753.

Perennial, finely puberulent; stem usually much branched, 2°–4° high, leafy. Leaves lanceolate or oblong-lanceolate, acute at the apex, narrowed at the base, few-veined, sessile, 1½′–4′ long, 3″–12″ wide, the upper surface rough; flowers yellowish-white, about 2″ long, sessile; calyx-segments linear-lanceolate, about equalling the corolla-tube; corolla funnelform, crested in the throat; style about as long as the stamens; nutlets, when mature, white, smooth, shining, about 1½″ high, ovoid, obtuse, more than one-half as long as the calyx-segments, seldom all ripening.

In fields and waste places, Ontario to southern New York, west to Minnesota. Plant grayish. Naturalized from Europe. Native also of Asia. Called also Graymile, Littlewale and Pearl-plant. May–Aug.

3. Lithospermum latifòlium Michx. American Gromwell. (Fig. 3045.)

Lithospermum latifolium Michx. Fl. Bor. Am. 1: 131. 1803.

Perennial, rough-puberulent; stem branched, 2°–3° high, the branches long and slender. Leaves ovate or ovate-lanceolate, acuminate at the apex, pinnately veined, 2′–5′ long, 1′–2′ wide, or the uppermost smaller; flowers yellowish white or pale yellow, 2″–3″ long, few, solitary, distant; calyx-segments linear-lanceolate, about as long as the corolla; corolla funnelform, crested in the throat; style shorter than the stamens; nutlets white, shining, globose-ovoid, about 2″ long, more than one-half as long as the calyx-segments.

In dry thickets and fields, Ontario and western New York to Minnesota, south to Virginia and Arkansas. May.

4. Lithospermum pilòsum Nutt. Woolly Gromwell. (Fig. 3046.)

Lithospermum pilosum Nutt. Journ. Phil. Acad. 7: 43. 1834.
Lithospermum Torreyi Nutt. loc. cit. 44. 1834.

Perennial from thick roots, hirsute, rather pale green; stems usually stout and clustered, very leafy, 8′–18′ high. Leaves lanceolate or linear-lanceolate, 2′–4′ long, 2″–5″ wide, gradually acuminate to the apex, narrowed at the base, sessile, indistinctly veined; flowers dull yellow, very numerous and crowded in a terminal leafy thyrsus; calyx-segments densely hirsute, shorter than the cylindric corolla-tube; corolla-salverform, the throat puberulent below each lobe; style longer than the filaments; nutlets ovoid, acute, white, shining, about 2″ long.

Western Nebraska (according to Williams), Montana to the Northwest Territory, British Columbia and California. May–July.

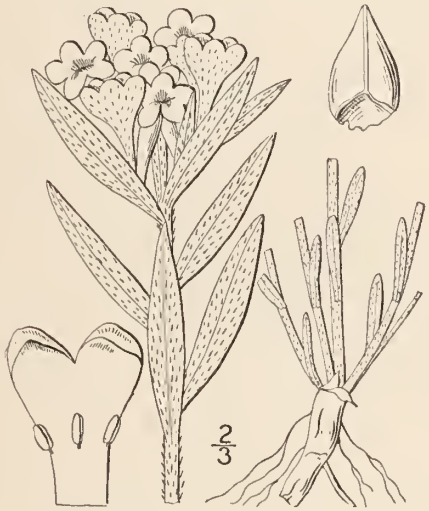
5. Lithospermum Gmélini (Michx.) A. S. Hitchcock. Hairy or Gmelin's Puccoon. (Fig. 3047.)

Batschia Carolinensis Gmel. Syst. 2: Part 1, 315. 1791.
Not *Lithospermum Carolinianum* Lam. 1791.
Batschia Gmelini Michx. Fl. Bor. Am. 1: 130. 1803.
Lithospermum hirtum Lehm. Asperif. 305. 1818.
L. Gmelini A. S. Hitchc. Spring Fl. Manh. 30. 1894.

Perennial, hispid-pubescent, or scabrous; stems usually clustered, rather stout, simple, or branched above, 1°–2° high, very leafy. Leaves lanceolate, sessile, obtuse or acute at the apex, narrowed at the base, 2′–3′ long, the lowest commonly reduced to appressed scales, the uppermost oblong; flowers 6″–8″ long, in dense short terminal leafy racemes, dimorphous; pedicels 1″–3″ long; calyx-segments linear-lanceolate, shorter than the tube of the orange-yellow salverform corolla; corolla-lobes entire, rounded, the throat crested, the tube bearded at the base within by 10 hirsute teeth; nutlets white, shining, about 2″ high, ovoid, very much shorter than the calyx-segments.

In dry woods, western New York to Florida, Minnesota, Colorado and New Mexico. April–June.

6. Lithospermum canéscens (Michx.) Lehm. Hoary Puccoon. (Fig. 3048.)



Batschia canescens Michx. Fl. Bor. Am. 1: 130. *pl. 14.* 1803.
Lithospermum canescens Lehm. Asperif. 305. 1818.

Perennial, hirsute, somewhat canescent, at least when young; stems solitary or cluste simple or often branched, 6′–18′ high. Leaves oblong, linear-oblong, or linear, obtuse or acutish at the apex, sessile by a narrowed base, ½′–1½′ long, 2″–5″ wide, the lowest often reduced to appressed scales; flowers about 6″ long, sessile, numerous in dense short leafy racemes, dimorphous; calyx-segments linear-lanceolate, shorter than the tube of the orange-yellow salverform corolla; corolla crested in the throat, its lobes rounded, entire, its tube glandular but not bearded at the base within; nutlets white, smooth, shining, acutish, much shorter than the calyx-segments.

In dry soil, Ontario to western New Jersey and Alabama, west to the Northwest Territory, Kansas and Arizona. April–June.

7. Lithospermum angustifòlium Michx. Narrow-leaved Puccoon. (Fig. 3049.)

L. angustifolium Michx. Fl. Bor. Am. 1: 130. 1803.

Perennial by a deep root, strigose-pubescent and scabrous; stem branched, 6′–2° high, the branches erect or ascending. Leaves linear, sessile, acute or acutish, ½′–2′ long, 1½″–2½″ wide; flowers of two kinds, in terminal leafy racemes; corolla of the earlier ones salverform, about 1′ long, bright yellow, the tube 3–5 times as long as the linear-lanceolate calyx-segments, the lobes erose-denticulate, the throat crested, the base of the tube not bearded within; later flowers (sometimes all of them) much smaller, pale yellow, cleistogamous, abundantly fertile, their pedicels recurved in fruit; nutlets white, smooth, shining, ovoid, 1½″–2″ high, more or less pitted, keeled on the inner side.

In dry soil, especially on prairies, Manitoba to Illinois, Kansas and Texas, west to British Columbia, Utah and Arizona. April–July.

12. ONOSMÒDIUM Michx. Fl. Bor. Am. 1: 132. 1803.

Perennial stout hispid or hirsute branching herbs, with alternate entire strongly veined leaves, and rather small yellowish or greenish white proterogynous flowers, in terminal leafy-bracted scorpioid spikes or racemes. Calyx deeply 5-parted, the segments narrow. Corolla tubular or tubular-funnelform, 5-lobed, the lobes erect, the throat not appendaged, the sinuses slightly inflexed, the tube with a glandular 10-lobed band within at the base. Stamens 5, inserted on the tube or throat of the corolla, included; filaments short. Ovary 4-parted; style filiform, exserted. Nutlets 4, or commonly only 1 or 2 perfecting, ovoid, sometimes sparingly pitted, shining, smooth, white, attached by the base to the nearly flat receptacle, the scar of attachment small, flat. [Greek, like *onosma*, or ass-smell.]

About 6 species, natives of North America and Mexico. Besides the following, 2 others occur in the southwestern United States.

Leaves acute; stem hirsute.
- Plant green; hairs long and shaggy; nutlets ovoid, 1½″ long. 1. *O. Carolinianum.*
- Plant pale; hairs shorter and soft; nutlets ovoid-globose, 2″ long. 2. *O. molle.*

Leaves obtuse; stem appressed-hispid. 3. *O. Virginianum.*

1. Onosmodium Carolinìanum (Lam.) DC. Shaggy False Gromwell. (Fig. 3050.)

Lithospermum Carolinianum Lam. Tabl. Encycl. 1: 367. 1791.
Onosmodium Carolinianum DC. Prodr. 10: 70. 1846.

Spreading-hirsute with rough bristly hairs; stem stout, usually much branched, 1°–3° high, the branches ascending. Leaves lanceolate, ovate-lanceolate or oblong, acute or acuminate at the apex, narrowed to the sessile base, 5–9-ribbed, 2′–4½′ long, ½′–1½′ wide; flowers very numerous and crowded; pedicels 1″–2″ long in fruit; calyx-segments linear, acute, somewhat shorter than the corolla-tube; corolla yellowish-white, pubescent outside, about 5″ long, its lobes triangular-lanceolate, acute, about one-half as long as the tube; nutlets obtuse, about 1½″ long.

In dry fields or thickets, or on banks, Ontario and western New York to Minnesota, south to Georgia and Texas. Ascends to 2200 ft. in Virginia. May–July.

2. Onosmodium mólle Michx. Soft-hairy False Gromwell. (Fig. 3051.)

Onosmodium molle Michx. Fl. Bor. Am. 1. 133. *pl. 15.* 1803.

Onosmodium Carolinianum var. *molle* A. Gray, Syn. Fl. 2: Part 1, 206. 1878.

Similar to the preceding species, but usually lower, 1°–2° high, canescent, at least when young, pale green, the pubescence soft and shorter, that of the leaves appressed. Leaves smaller, ovate-lanceolate, ½′–2′ long, sessile; corolla-lobes usually less than one-half the length of the tube; nutlets larger, globose-ovoid, fully 2″ high.

On prairies, Manitoba and the Northwest Territory to Illinois, Kansas, Texas and Utah. May–July.

3. Onosmodium Virginiànum (L.) DC. Virginia False Gromwell. (Fig. 3052.)

Lithospermum Virginanum L. Sp. Pl. 132. 1753.
Onosmodium Virginianum DC. Prodr. 10: 70. 1846.

Densely appressed-hispid with stiff hairs; stem rather slender, usually branched above, 1°–2½° high. Leaves oblong, oval, or oblong-lanceolate, obtuse, sessile, 1′–3′ long, or the lower oblanceolate, acutish and narrowed into petioles; calyx-segments linear-lanceolate, acuminate; corolla cylindric or nearly so, yellowish-white, about 4″ long, the lobes lanceolate, acuminate, nearly as long as the tube, strigose without; nutlets ovoid, obtuse or obtusish, 1″–1½″ long.

In dry thickets or on hillsides, New England to Florida, Pennsylvania, Kansas and Texas. Ascends to 3000 ft. in Virginia. May–July.

13. SÝMPHYTUM L. Sp. Pl. 136. 1753.

Erect coarse rough hairy perennial branching herbs, with thick mucilaginous roots, alternate entire leaves, those of the stem mostly clasping, the uppermost tending to be opposite, the lower long-petioled. Flowers yellow, blue, or purple, in terminal simple or forked scorpioid racemes. Calyx deeply 5-cleft. Corolla tubular, slightly dilated above, 5-lobed, the lobes short, the throat with 5 crests below the lobes. Stamens 5, included, inserted on the corolla-tube; filaments slender. Ovary 4-divided; style filiform. Nutlets 4, obliquely ovoid, slightly incurved, wrinkled, inserted by their bases on the flat receptacle, the scar of the attachment broad, concave, dentate. [Greek, grow-together, from its supposed healing virtues.]

About 15 species, natives of the Old World.

1. Symphytum officinàle L. Comfrey. Healing-herb. (Fig. 3053.)

Symphytum officinale L. Sp. Pl. 136. 1753.

Roots thick, deep; stem erect, branched, 2°–3° high. Leaves lanceolate, ovate-lanceolate, or the lower ovate, pinnately veined, 3′–10′ long, acute or acuminate at the apex, narrowed into margined petioles, or the uppermost smaller and sessile, decurrent on the stem; petioles of the basal leaves sometimes 12′ long; flowers numerous, in dense racemes or clusters; pedicels 2″–4″ long; calyx-segments ovate or ovate-lanceolate, acute or acuminate, much shorter than the corolla; corolla yellowish or purplish, 6″–10″ long; nutlets brown, shining, slightly wrinkled, 2″ high.

In waste places, Newfoundland to Minnesota, south to Maryland. Naturalized or adventive from Europe. Native also of Asia. June–Aug. Called also Back- or Black-wort, Bruisewort, Knit-back, Boneset.

14. BORÀGO L. Sp. Pl. 137. 1753.

Hirsute or hispid annual or biennial branching herbs, with alternate entire leaves, and showy blue flowers, in terminal loose leafy racemes. Calyx deeply 5-cleft or 5-parted. Corolla rotate, the tube very short, the throat closed by scales, the limb 5-lobed, the lobes imbricated, acute. Stamens 5, inserted on the corolla-tube; filaments dilated below, narrowed above into a slender appendage; anthers linear, erect, and connivent into a cone. Ovary 4-divided; style filiform. Nutlets 4, ovoid, erect, attached by their bases to the flat receptacle, the scar of attachment large, concave. [Middle Latin, *burra*, rough hair, alluding to the foliage.]

Three species, natives of the Mediterranean region.

1. Borago officinàlis L. Borage. (Fig. 3054.)

Borago officinalis L. Sp. Pl. 137. 1753.

Stem erect, branched, 1°–2½° high, the branches spreading or ascending. Leaves oblong to obovate, acute or obtuse at the apex, 2′–5′ long, narrowed into margined petioles, or the upper smaller, ovate-lanceolate, sessile or partly clasping; flowers 8″–10″ broad, pedicels rather stout, 1½′–2′ long, spreading or recurving; calyx-segments lanceolate, nearly erect in fruit; corolla bright blue, the lobes ovate-lanceolate; the cone of anthers darker, about 3″ long; nutlets 2″ high.

In waste places, escaped from gardens, Nova Scotia to Ontario and Pennsylvania. Native of southern Europe. June–Sept.

15. LYCÓPSIS L. Sp. Pl. 138. 1753.

Annual bristly-hispid branched erect or diffuse herbs, with alternate leaves, and small blue or bluish flowers, in dense leafy-bracted terminal spike-like scorpioid racemes. Calyx 5-parted. Corolla slightly irregular, salverform, the tube curved, the limb somewhat unequally 5-lobed, the lobes obtuse, imbricated, the throat closed by hispid scales. Stamens 5, included, inserted on the tube of the corolla; filaments short; anthers obtuse at each end. Ovary 4-divided; style filiform. Nutlets 4, wrinkled, erect, attached by their bases to the flat receptacle, the scar of attachment concave. [Greek, wolf-face.]

About 4 species, natives of the Old World.

1. Lycopsis arvénsis L. Small Bugloss. (Fig. 3055.)

Lycopsis arvensis L. Sp. Pl. 139. 1753.

Stem erect or ascending, at length divergently or diffusely branched, 1°–2° high, the branches becoming procumbent. Leaves lanceolate, narrowly oblong or the lower oblanceolate, obtuse, 1′–2′ long, undulate or dentate, sessile, or the lower narrowed into petioles, the upper much smaller and acute or acutish; flowers numerous, crowded, 2″–3″ broad, very short-pedicelled; calyx-segments lanceolate, acute, nearly as long as the curved corolla-tube; nutlets shorter than the calyx.

In fields and waste places, Nova Scotia to Ontario, Pennsylvania and Virginia. Naturalized or adventive from Europe. Native also of Asia. June–Sept.

16. ÉCHIUM L. Sp. Pl. 139. 1753.

Biennial or perennial mostly bristly-hirsute branching herbs, with alternate leaves, and rather large blue violet or rarely white flowers, in leafy-bracted scorpioid spikes. Calyx 5-parted, the segments narrow. Corolla tubular-funnelform, irregular, the limb unequally 5-lobed, the lobes rounded, spreading, the throat not appendaged. Stamens 5, inserted low down on the tube of the corolla, unequal, at least the longer ones exserted; filaments slender, dilated at the base; anthers ovate or oblong. Ovary 4-divided; style filiform, 2-cleft at the summit. Nutlets 4, erect, ovoid, rugose, attached by their bases to the flat receptacle, the scar of attachment not concave. [Greek, a viper.]

About 30 species, natives of the Old World.

1. **Echium vulgàre** L. Viper's Bugloss. Blueweed. (Fig. 3056.)

Echium vulgare L. Sp. Pl. 140. 1753.

Bristly-hairy, biennial; stem erect, at length much branched, 1°–2½° high. Leaves oblong, linear-oblong, or linear-lanceolate, obtuse or acute, entire, 2′–6′ long, sessile, or the lower and basal ones narrowed into petioles; flowers bright blue, varying to violet purple, 8″–12″ long, numerous in short 1-sided spikes, forming a narrow thyrsus; calyx-segments much shorter than the corolla; limb of the corolla oblique, the lobes very unequal.

In fields and waste places, New Brunswick to Virginia, west to Ontario and Nebraska. A troublesome weed in some sections of the North. Naturalized from Europe. Native also of Asia. June-July. Called also Viper's-herb, Viper's-grass, Snake-flower, Blue-thistle.

Family 24. **VERBENÀCEAE** J. St. Hil. Expos. Fam. 1: 245. 1805.

VERVAIN FAMILY.

Herbs, shrubs or some tropical genera trees, with opposite verticillate or rarely alternate leaves, and perfect more or less irregular, or sometimes regular flowers, in terminal or axillary spikes, racemes, cymes or panicles. Calyx inferior, mostly persistent, usually 4–5-lobed or 4–5-cleft. Corolla gamopetalous, regular, or 2-lipped, the tube usually cylindric and the limb 4–5-cleft. Stamens 4, didynamous, rarely only 2, or as many as the corolla-lobes, inserted on the corolla and alternate with its lobes; anthers 2-celled, the sacs longitudinally dehiscent. Ovary superior, 2–4-celled (rarely 8–10-celled), composed of 2 carpels, each carpel with 2 anatropous or amphitropous ovules, thus in 4-celled ovaries 1 ovule in each cavity; style terminal, simple; stigmas 1 or 2. Fruit dry, separating at maturity into 2–4 nutlets, or a drupe containing the 2–4 nutlets. Endosperm little or none, or rarely fleshy; embryo straight.

About 70 genera and 1200 species, of wide geographic distribution in temperate and warm regions.

Flowers in heads or spikes; ovary 2–4-celled; fruit of 2 or 4 erect nutlets; ours herbs.
- Corolla-limb 5-lobed, regular or nearly so; nutlets 4. — 1. *Verbena.*
- Corolla-limb 4-lobed, 2-lipped; nutlets 2. — 2. *Lippia.*

Flowers in axillary cymes; shrubs; fruit drupaceous. — 3. *Callicarpa.*

1. **VERBÈNA** L. Sp. Pl. 18. 1753.

Herbs (some exotic species shrubby), mostly with opposite leaves, and variously colored bracted flowers, in terminal solitary corymbed or panicled spikes. Calyx usually tubular, 5-angled, more or less unequally 5-toothed. Corolla salverform or funnelform, the tube straight or somewhat curved, the limb spreading, 5-lobed, slightly 2-lipped or regular. Stamens 4, didynamous, or very rarely only 2, included; connective of the anthers unappendaged, or sometimes provided with a gland. Ovary 4-celled; ovule 1 in each cavity; style usually short, 2-lobed at the summit, one of the lobes stigmatic. Fruit dry, mostly enclosed by the calyx, at length separating into 4, 1-seeded linear or linear-oblong crustaceous smooth papillose or rugose nutlets. [Latin name of a sacred herb.]

About 100 species, natives of America, or a single one indigenous in the Mediterranean region. Besides the following, some 13 others occur in the southern and western parts of North America.

Flowers 2″–5″ long, in narrow spikes; anthers unappendaged.
- Spikes filiform or slender; bracts shorter than the flowers.
  - Spikes filiform; fruit scattered; corolla usually white.
    - Leaves incised or pinnatifid; diffuse annual; fruit short. — 1. *V. officinalis.*
    - Leaves serrate (rarely incised); erect perennial; fruit oblong. — 2. *V. urticifolia.*
  - Spikes slender; fruits densely imbricated; corolla blue.
    - Plants glabrous or sparingly rough-pubescent; corolla 2″–3″ long.
      - Leaves lanceolate, acuminate, petioled. — 3. *V. hastata.*
      - Leaves linear or spatulate-lanceolate, mostly obtuse and sessile. — 4. *V. angustifolia.*
    - Plants densely soft-pubescent; corolla 4″–5″ long. — 5. *V. stricta.*
- Spikes thick, dense; bracts longer than the flowers. — 6. *V. bracteosa.*

Flowers 7″–12″ long, in short dense elongating spikes; connective of the longer stamens appendaged.
- Corolla-limb 6″–10″ broad; bracts mostly shorter than the calyx. — 7. *V. Canadensis.*
- Corolla-limb 4″–5″ broad; bracts equalling or exceeding the calyx. — 8. *V. bipinnatifida.*

1. Verbena officinàlis L. European Vervain. Herb-of-the-Cross. Berbine. (Fig. 3057.)

Verbena officinalis L. Sp. Pl. 20. 1753.

Annual; stem 4 sided, slender, glabrous or nearly so, ascending or spreading, diffusely branched, 1°–3° high. Leaves minutely pubescent, the lower deeply incised or 1–2 pinnatifid, ovate, oblong, or obovate in outline, 1′–3′ long, narrowed into margined petioles, the teeth acute; upper leaves linear or lanceolate, acute, entire, sessile; spikes several or numerous, filiform, at length 4′–5′ long; fruits less than 1″ high, scattered along the spikes, not at all imbricated; bracts ovate, acuminate, shorter than the 5-toothed calyx; corolla purplish or white, the limb 1″–2″ broad.

In waste and cultivated ground, Maine to Florida and Texas. Also on the Pacific Coast. Naturalized from the Old World. Sometimes a troublesome weed. Called Holy-herb, Enchanter's-plant, Juno's-tears, Pigeon's-grass, Simpler's Joy. June–Sept.

2. Verbena urticifòlia L. White or Nettle-leaved Vervain. (Fig. 3058.)

Verbena urticifolia L. Sp. Pl. 20. 1753.

Perennial, usually pubescent; stem slender, strict, erect, 4-sided, paniculately branched above, 3°–5° high, the branches upright. Leaves ovate, oblong, or oblong-lanceolate, all petioled, or the uppermost sessile, serrate-dentate all around, thin, acute or acuminate, mostly rounded at the base, 1½′–5′ long; spikes numerous, filiform, erect, or spreading, at length 4′–6′ long; fruits oblong, scattered, not at all imbricated, about 1″ high; bracts ovate, acuminate, shorter than the calyx; corolla white or pale purple, its limb about 1″ broad.

In fields and waste places, New Brunswick to Minnesota, Florida and Texas. Hybridizes with *V. bracteosa*, *V. hastata* and *V. stricta*. June–Sept.

Verbena urticifòlia ripària (Raf.) Britton, Mem. Torr. Club, 5: 276. 1894.

Verbena riparia Raf.; Small & Heller, Mem. Torr. Club, 3: 12. 1892.

Leaves incised, sometimes 3-cleft near the base; flowers blue. River-banks, New Jersey to North Carolina.

3. Verbena hastàta L. Blue Vervain. Wild Hyssop. (Fig. 3059.)

Verbena hastata L. Sp. Pl. 20. 1753.
Verbena paniculata Lam. Encycl. 8: 548. 1808.

Perennial, roughish-puberulent; stem erect, strict, 4-sided, usually branched above, 3°–7° high. Leaves oblong-lanceolate or lanceolate, petioled, acute or acuminate at the apex, narrowed at the base, serrate or incised-dentate with acute teeth, 3′–6′ long, the lower sometimes hastately 3-lobed at the base; spikes numerous, panicled, slender, usually peduncled, 2′–6′ long; fruits densely imbricated on the spikes, 1″–1½″ high; bracts ovate, acuminate, shorter than the calyx; corolla blue, its limb about 1½″ broad.

In moist fields, meadows and in waste places, Nova Scotia to British Columbia, south to Florida, Nebraska and New Mexico. Hybridizes with *V. stricta* and *V. bracteosa*. June–Sept.

Verbena hastàta pinnatífida (Lam.) Britton, Mem. Torr. Club, 5: 276. 1894.

Verbena pinnatifida Lam. Tabl. Encycl. 1: 57. 1791.

Leaves deeply incised or pinnatifid. Occasional in the range of the type.

4. Verbena angustifòlia Michx. Narrow-leaved Vervain. (Fig. 3060.)

Verbena angustifolia Michx. Fl. Bor. Am. 2: 14. 1803.

Perennial, roughish-puberulent or pubescent; stem slender, simple or branched, 4-sided above, 1°–2° high. Leaves linear, spatulate or lanceolate, obtuse or subacute at the apex, cuneate at the base and tapering into short petioles, serrate or serrulate, veiny, 1½′–3′ long, 2″–5″ wide; spikes mostly solitary at the ends of the branches, usually peduncled, slender, dense, 2′–5′ long; fruits overlapping or the lower somewhat distant, 1½″ high; bracts lanceolate, acuminate, equalling or shorter than the calyx; corolla purple or blue, about 3″ long, its limb about as broad, the lobes obovate or oblong.

In dry fields, Massachusetts to Florida, west to Minnesota, Illinois and Arkansas. Hybridizes with *V. stricta* and *V. bracteosa*. June–Aug.

6. Verbena bracteòsa Michx. Large-bracted Vervain. (Fig. 3062.)

V. bracteosa Michx. Fl. Bor. Am. 2: 13. 1803.

Perennial, hirsute-pubescent; stem 4-sided, much branched from the base, the branches decumbent or ascending, slender, 6′–15′ long. Leaves ovate, oval, or obovate in outline, pinnately incised or pinnatifid, 1′–3′ long, more or less cuneate at the base and narrowed into short petioles, the lobes mostly dentate; spikes sessile, stout, dense, becoming 4′–6′ long in fruit; bracts conspicuous, linear-lanceolate, rather rigid, longer than the flowers and fruits, the lower ones often incised; corolla purplish blue, about 2″ long.

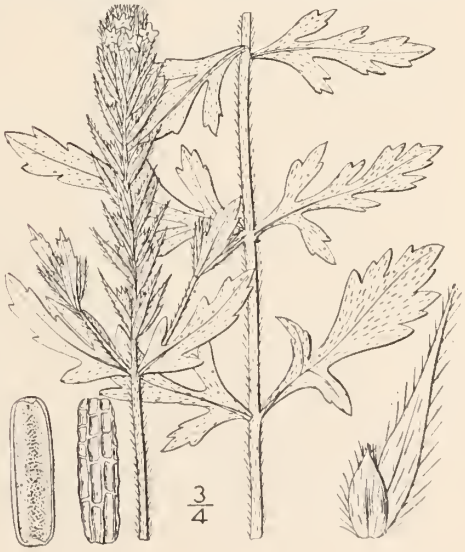
On prairies and in waste places, Minnesota and Illinois to Alabama and Florida, west to British Columbia, Arizona and California. Hybridizes with *V. Canadensis*. May–Aug.

5. Verbena stricta Vent. Hoary or Mullen-leaved Vervain. (Fig. 3061.)

Verbena stricta Vent. Descr. Pl. Jard. Cels. *pl. 53.* 1800.
Verbena rigens Michx. Fl. Bor. Am. 2: 14. 1803.

Perennial, densely soft-pubescent all over; stem stout, obtusely 4-angled, simple, or branched above, strict, very leafy, 1°–2½° high. Leaves ovate, oval, or oblong, very short-petioled, acute or obtuse at the apex, narrowed at the base, prominently veined, incised-serrate or laciniate, 1′–4′ long; spikes solitary, or several, mostly sessile, dense, stout, becoming 6′–12′ long in fruit; fruits much imbricated, 2″–2½″ high; bracts lanceolate-subulate, nearly as long as the calyx; corolla purplish blue, 4″–5″ long, its limb nearly as broad.

In dry soil, Ohio to Minnesota, Nebraska and Wyoming, south to Tennessee, Texas and New Mexico. Naturalized as a weed further east. Hybridizes with *V. bracteosa*. June–Sept.

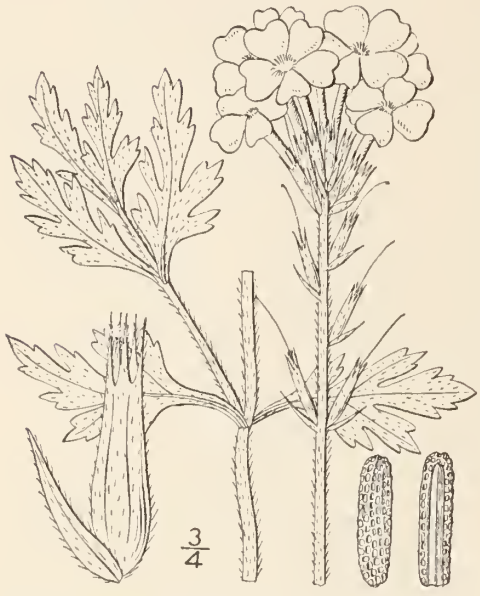


7. Verbena Canadénsis (L.) Britton. Large-flowered Verbena. (Fig. 3063.)

Buchnera Canadensis L. Mant 88. 1767.
Verbena Aubletia Jacq. Hort. Vind. 2: 82. *pl.* 176. 1772.
Glandularia Carolinensis J. G. Gmel. Syst. 2: 920. 1796.
Verbena Canadensis Britton, Mem. Torr. Club, 5: 276. 1894.

Perennial, pubescent or glabrate; stem slender, usually branched, 8′–15′ high, the branches ascending. Leaves membranous, ovate in outline, petioled, 1′–3′ long, truncate or broadly cuneate at the base, irregularly pinnately incised, often 3-cleft, the lobes dentate; spikes peduncled, solitary at the ends of the branches, dense, short and capitate when in early flower, becoming 2′–4′ long in fruit; bracts linear-subulate, mostly shorter than the calyx; calyx-teeth filiform-subulate; corolla 10″–12″ long, blue, purple, white or in cultivation variegated, its limb 6″–10″ broad, the lobes oblong or obovate, emarginate or obcordate; fruit 2½″–3″ high.

In dry soil, Illinois to Tennessee and Florida, west to Kansas, Mexico and New Mexico. This and the next the source of many garden and other hybrids. May–Aug.



8. Verbena bipinnatífida Nutt. Small-flowered Verbena. (Fig. 3064.)

Verbena bipinnatifida Nutt. Journ. Acad. Phila. 2: 123. 1821.
Glandularia bipinnatifida Nutt. Trans. Am. Phil. Soc. (II.) 5: 184. 1833–37.

Perennial, producing suckers, hirsute or hispid; stems rather stout, mostly branched, erect, 6′–18′ high. Leaves firm, petioled or the uppermost sessile, broadly ovate in outline, deeply 1–2-pinnatifid into linear or linear-oblong, obtuse or subacute lobes and segments; spikes peduncled or sessile, solitary at the ends of the branches, thick, dense, at first short and capitate, becoming 2′–4′ long in fruit; bracts linear-subulate, mostly shorter than the calyx; calyx-teeth filiform-subulate; corolla 6″–9″ long, purple or lilac, the limb 4″–5″ broad, the lobes emarginate or obcordate; fruit 1½″–2″ high.

On dry plains and prairies, Nebraska to Texas and Chihuahua, west to Colorado and Arizona. May–Sept.

2. LÍPPIA L. Sp. Pl. 633. 1753.

Perennial herbs, or shrubs, with opposite, sometimes verticillate, or rarely alternate leaves, and small bracted flowers, in axillary or terminal, mostly peduncled spikes or heads. Calyx small, membranous, ovoid, campanulate or compressed and 2-winged, 2–4-toothed or 2–4-cleft. Corolla-tube straight or incurved, cylindric, the limb oblique, spreading, somewhat 2-lipped, 4-cleft, the lobes broad, often retuse or eroded. Stamens 4, didynamous, included or exserted; anthers ovate, not appendaged, the sacs nearly parallel. Ovary 2-celled; ovules 1 in each cavity; style short; stigma oblique or recurved. Fruit dry, with a membranous exocarp, at length separating into 4 nutlets. [Named in honor of Auguste Lippi, 1678–1703, a French naturalist.]

About 100 species, most abundant in tropical and subtropical America, a few African. Besides the following, about 6 others occur in the southern and southwestern United States.

Leaves spatulate, 2–8-toothed above; peduncles little exceeding the leaves. 1. *L. cuneifolia.*
Leaves sharply serrate; peduncles much longer than the leaves.
  Leaves oblong or lanceolate, mostly acute. 2. *L. lanceolata.*
  Leaves spatulate or obovate, mostly obtuse. 3. *L. nodiflora.*

1. Lippia cuneifòlia (Torr.) Steud. Wedge-leaved Fog-fruit. (Fig. 3065.)

Zapania cuneifolia Torr. Ann. Lyc. N. Y. 2: 234. 1827.
Lippia cuneifolia Steud.; Torr. in Marcy's Rep. 293. *pl. 17.* 1853.

Pale, minutely puberulent with forked hairs or glabrous, diffusely branched from the woody base; branches terete, slender, rigid, procumbent, somewhat zigzag, with short erect branchlets at the nodes. Leaves linear-cuneate, sessile, obscurely veined, rigid, 1′–1½′ long, 2″–3″ wide, with 2–8 sharp teeth above the middle or rarely entire, acutish at the apex; peduncles shorter than or somewhat exceeding the leaves; head at first globose, becoming cylindric and 6″–8″ long; bracts cuneate, abruptly acuminate from the truncate or retuse summit; calyx flattened, 2-cleft, the lobes 2-toothed or emarginate; corolla-tube longer than the calyx; fruit oblong.

On plains, Nebraska and Colorado to Texas, Mexico and Arizona. May–Aug.

2. Lippia lanceolàta Michx. Fog-fruit. (Fig. 3066.)

L. lanceolata Michx. Fl. Bor. Am. 2: 15. 1803.

Green, glabrous, or very sparingly pubescent with forked hairs; stems slender, weak, procumbent or ascending, sometimes rooting at the nodes, simple, or little branched, 1°–2° long. Leaves thin, oblong, ovate, or oblong-lanceolate, pinnately veined, short-petioled, acute or subacute at the apex, sharply serrate to below the middle, narrowed to the somewhat cuneate base, 1′–3′ long, 3″–15″ wide; peduncles slender, some or all of them longer than the leaves; heads at first globose, becoming cylindric and about ½′ long in fruit; bracts acute; calyx flattened, 2-cleft; corolla pale blue, scarcely longer than the calyx; fruit globose.

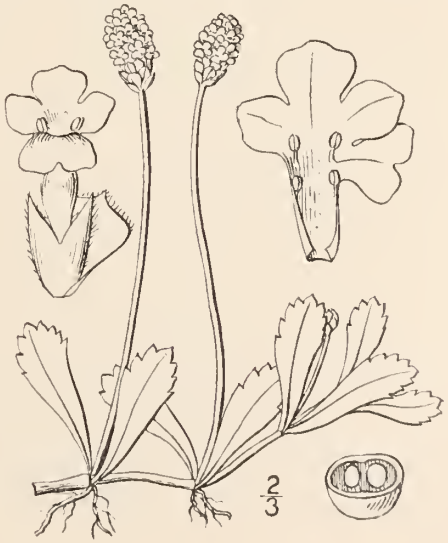
In moist soil, New Jersey to Illinois and Kansas, south to Florida, Texas and northern Mexico. Also in California. June–Aug.

3. Lippia nodiflòra (L.) Michx. Spatulate-leaved Fog-fruit. (Fig. 3067.)

Verbena nodiflora L. Sp. Pl. 20. 1753.
Lippia nodiflora Michx. Fl. Bor. Am. 2: 15. 1803.

Minutely and rather densely puberulent with short appressed hairs, creeping, or some of the branches ascending, 1°–3° long. Leaves thickish, spatulate, oblanceolate, or obovate, 6″–2½′ long, 3″–12″ wide, mostly obtuse at the apex, narrowed into a long or short cuneate entire base, sharply serrate above the middle; peduncles slender, 1′–6′ long, much longer than the leaves; heads at length cylindric and 5″–12″ long, 3″–4″ thick; calyx flattened, 2-cleft; corolla purple to white.

In wet or moist soil, Georgia to southern Missouri, Florida and Texas. Also in California, Central America, the West Indies, and apparently the same species in the warmer regions of the Old World. May–Sept.



3. CALLICÀRPA L. Sp. Pl. 111. 1753.

Shrubs or trees, with opposite leaves, and small blue purple or white flowers in axillary cymes. Calyx short, campanulate, 4-toothed (rarely 5-toothed), or truncate. Corolla-tube short, expanded above, the limb spreading, 4-cleft (rarely 5-cleft), the lobes equal, imbricated in the bud. Stamens 4, equal, exserted; anthers ovate or oval, their sacs parallel. Ovary incompletely 2-celled; ovules 2 in each cavity, laterally attached, amphitropous; style slender; stigma capitate, or 2-lobed. Fruit a berry-like drupe, much longer than the calyx, containing 1–4 nutlets. [Greek, handsome fruit.]

About 35 species, the following of southeastern North America, the others Asiatic, African and of tropical America.

1. Callicarpa Americàna L. French Mulberry. (Fig. 3068.)

Callicarpa Americana L. Sp. Pl. 111. 1753.

A shrub, 2°–5° high, the twigs, petioles and young leaves stellate-scurfy, the mature leaves glabrous or nearly so, and glandular-dotted. Twigs terete; leaves thin, ovate, pinnately veined, slender-petioled, acute or acuminate at the apex, crenate-dentate nearly to the entire base, 3′–6′ long, 1½′–3′ wide; cymes many-flowered, short-peduncled; pedicels very short; calyx-teeth much shorter than the tube; corolla pale blue, about 1½″ long; fruit violet-blue, globose, 1½″ in diameter, very conspicuous in autumn.

In moist thickets, Virginia to Florida, Alabama, Arkansas and Texas. June–July.

Family 25. LABIÀTAE B. Juss. Hort. Trian. 1759.

Mint Family.

Aromatic punctate herbs, or shrubs (a few tropical species trees), mostly with 4-sided stems and simple opposite leaves; stipules none. Flowers irregular, perfect, variously clustered, the inflorescence typically cymose, usually bracteolate. Calyx inferior, persistent, regular or 2-lipped, 5-toothed or 5-lobed (rarely 4-toothed), mostly nerved. Corolla with a short or long tube, the limb 4–5-lobed, mostly 2-lipped, regular in a few genera; upper lip 2-lobed, or sometimes entire; lower lip mostly 3-lobed. Stamens borne on the corolla-tube, typically 4 and didynamous, sometimes 2 with or without staminodia, rarely equal; filaments separate, mostly slender, alternate with the corolla-lobes; anthers 2-celled, introrse, or confluently 1-celled, or sometimes of a single sac. Disk usually present, fleshy. Ovary 4-lobed, or 4-parted, superior, each lobe or division with 1 mostly anatropous ovule; style arising from the centre of the lobed or parted ovary, 2-lobed at the summit. Fruit of 4 1-seeded nutlets. Seed erect (transverse in *Scutellaria*); endosperm scanty, or usually none; embryo mostly straight; radicle short, inferior.

About 160 genera and 3000 species, of wide distribution in temperate and tropical regions. The family is also known as Lamiaceae. The foliage abounds in volatile oils.

A. Ovary 4-lobed, the style not basal; nutlets laterally attached.

Corolla-limb very irregular, apparently 1-lipped, or the other lip very short; stamens exserted.
- Upper lip of corolla short, truncate. — 1. *Ajuga.*
- Upper lip of corolla 2-lobed, or all the lobes united into the lower lip. — 2. *Teucrium.*

Corolla-limb nearly equally 5-lobed.
- Corolla-lobes spreading; stamens short-exserted. — 3. *Isanthus.*
- Corolla-lobes declined; stamens long-exserted. — 4. *Trichostema.*

B. Ovary 4-parted, the style basal; nutlets basally attached.

* Calyx with a protuberance on the upper side. — 5. *Scutellaria.*

* * Calyx not gibbous on the upper side.

Stamens and style very short, included in the corolla-tube. — 6. *Marrubium.*

Stamens longer, not included in the corolla-tube.

† *Corolla strongly 2-lipped; lips unlike, the upper concave.*

(**a.**) Anther-bearing stamens 4.

Posterior (upper) pair of stamens longer than the anterior.
- Anther-sacs parallel or nearly so.
  - Tall erect herbs; posterior stamens declined, anterior ascending. 7. *Agastache.*
  - Trailing herb; stamens all ascending under upper lip of corolla. 8. *Meehania.*
- Anther-sacs divergent.
  - Calyx tubular, nearly equally 5-toothed, not 2-lipped; plant erect. 9. *Nepeta.*
  - Calyx distinctly 2-lipped, or unequally 5-toothed.
    - Trailing herb; calyx unequally 5-toothed. 10. *Glecoma.*
    - Erect herbs; calyx 2-lipped. 11. *Dracocephalum.*

Posterior pair of stamens shorter than the anterior.
- Calyx distinctly 2-lipped, closed in fruit. 12. *Prunella.*
- Calyx 3–10-toothed, not distinctly 2-lipped, open in fruit.
  - Calyx membranous, inflated in fruit, faintly nerved.
    - Calyx nearly equally 5-toothed, or 5-lobed. 13. *Physostegia.*
    - Calyx 4-lobed. 14. *Synandra.*
  - Calyx not membranous, not inflated in fruit, distinctly 5–10-nerved.
    - Style-branches very unequal. 15. *Phlomis.*
    - Style-branches equal, or nearly so.
      - Anther-sacs transversely 2-valved. 16. *Galeopsis.*
      - Anther-sacs not transversely 2-valved, parallel or divergent.
        - Nutlets 3-sided, truncate.
          - Calyx-teeth not spiny-tipped. 18. *Lamium.*
          - Calyx-teeth spiny-tipped. 17. *Leonurus.*
        - Nutlets ovoid, rounded above.
          - Calyx with a spreading 5-toothed limb. 19. *Ballota.*
          - Calyx-limb not spreading.
            - Corolla-tube not longer than the calyx; anther-sacs divergent. 20. *Stachys.*
            - Corolla-tube exserted; lower petioles very long; anther-sacs parallel. 21. *Betonica.*

(**b.**) Anther-bearing stamens 2.

Connective of the anther very long, bearing a perfect sac at one end, and a rudimentary one, or none, at the other. 22. *Salvia.*

Connective very short, the anther-sacs confluent.
- Calyx tubular, 15-nerved, equally 5-toothed. 23. *Monarda.*
- Calyx ovoid-tubular, 13-nerved, 2-lipped. 24. *Blephilia.*

† † *Corolla 2-lipped, or regular; upper lip, when present, flat, or only slightly concave.*

(**a.**) Flowers in axillary whorls or clusters, or these forming terminal spikes.

Corolla 2-lipped.
- Stamens curved, often converging, or ascending under the upper lip of the corolla.
  - Anther-bearing stamens 2. 25. *Hedeoma.*
  - Anther-bearing stamens 4.
    - Corolla-tube upwardly curved, exserted. 26. *Melissa.*
    - Corolla-tube straight.
      - Calyx 10-nerved, campanulate, about equally 5-toothed. 27. *Satureia.*
      - Calyx mostly 13-nerved, tubular, 2-lipped. 28. *Clinopodium.*
- Stamens straight, often diverging.
  - Calyx 15-nerved. 29. *Hyssopus.*
  - Calyx 10–13-nerved.
    - Anther-bearing stamens 4.
      - Anther-sacs divergent.
        - Calyx equally 5-toothed; erect herbs. 30. *Origanum.*
        - Calyx 2-lipped; creeping herbs. 32. *Thymus.*
      - Anther-sacs parallel. 31. *Koellia.*
    - Anther-bearing stamens 2. 33. *Cunila.*

Corolla regular, 4–5-lobed.
- Anther-bearing stamens 2; plants not aromatic. 34. *Lycopus.*
- Anther-bearing stamens 4; aromatic fragrant herbs. 35. *Mentha.*

(**b.**) Flowers in terminal panicled racemes or spikes; corolla 2-lipped.

Anther-bearing stamens 2; lower lip of corolla long, fimbriate; native. 36. *Collinsonia.*

Anther-bearing stamens 4; lower lip of corolla not fimbriate; introduced.
- Flowers racemose. 37. *Perilla.*
- Flowers densely spiked. 38. *Elsholtzia.*

1. ÁJUGA L. Sp. Pl. 561. 1753.

Annual or perennial, often stoloniferous herbs, mostly with dentate leaves, and rather large verticillate-clustered flowers in terminal spikes, or in the upper axils. Calyx ovoid or campanulate, 10–many-nerved, 5 toothed or 5-lobed, the teeth or lobes nearly equal. Corolla-limb 2-lipped, the upper lip short, truncate or emarginate, the lower spreading, with 2 small lateral lobes and a much larger emarginate or 2-cleft middle one. Stamens 4, didynamous, somewhat exserted beyond the upper lip of the corolla, the anterior pair the longer; anther-

sacs divergent, only slightly confluent at the base. Ovary not deeply 4-lobed. Nutlets obovoid, rugose-reticulate. [Greek, without a yoke; from the seeming absence of the upper lip of the corolla.]

About 40 species, natives of the Old World.

1. Ajuga réptans L. Bugle.
(Fig. 3069.)

Ajuga reptans L. Sp. Pl. 561. 1753.

Perennial, sparingly pubescent or glabrous, producing slender creeping stolons sometimes 1° long; stem erect, rather stout, 6′–15′ tall. Basal leaves tufted, obovate, rounded at the apex, crenate or undulate, 1′–3′ long, tapering into margined petioles; leaves of the stem oblong or oblanceolate, much smaller, sessile or nearly so, those of the stolons mostly petioled; upper flower-clusters, often forming a short spike, the lower commonly distant and axillary; corolla blue or nearly white, about ½′ long.

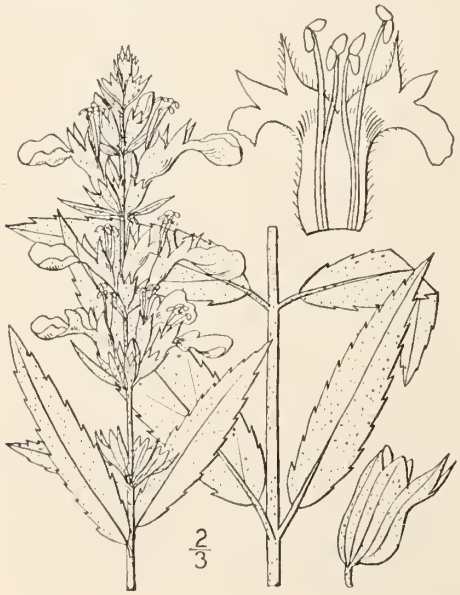
In fields, Quebec and Maine to southern New York, locally naturalized from Europe. Old names, Brown Bugle, Middle Comfrey, Carpenter's Herb, Sicklewort. May–June.

2. TEÙCRIUM L. Sp. Pl. 562. 1753.

Herbs or shrubs, with dentate entire or laciniate leaves, and rather small pink white or purplish flowers, in terminal bracted spikes or heads, or verticillate in the upper axils. Calyx tubular-campanulate, 10-nerved, equally or unequally 5-toothed. Corolla-tube short, the limb irregularly 5-lobed, the 2 short upper lobes oblong, declined or erect, the lateral lobe declined, more or less united with the upper ones, the lower lobe broader, also declined. Stamens 4, didynamous, exserted between the 2 upper lobes of the corolla, the anterior pair the longer; anther-sacs divergent, confluent at the base. Ovary 4-lobed; style 2-cleft at the summit. Nutlets obovoid, rugose-reticulated. [Named from the Trojan king, Teucer.]

Over 100 species, of wide distribution in temperate and tropical regions. Besides the following, 2 others occur in the southern and southwestern United States.

Calyx canescent, its upper teeth obtuse. 1. *T. Canadense.*
Calyx villous, its upper teeth acutish. 2. *T. occidentale.*



1. Teucrium Canadénse L.
American Germander or Wood Sage.
(Fig. 3070.)

Teucrium Canadense L. Sp. Pl. 564. 1753.
Teucrium Virginicum L. Sp. Pl. 564. 1753.

Perennial, pubescent or canescent; stem stiff, erect, simple or somewhat branched, rather slender, 1°–2° tall. Leaves lanceolate, oblong-lanceolate or ovate-lanceolate, acuminate at the apex, irregularly dentate, mostly narrowed at the base, short-petioled, 1½′–5′ long, ½′–2′ wide; spike usually dense, becoming 6′–12′ long in fruit, its lower bracts sometimes foliaceous; upper bracts commonly not longer than the calyx; flowers 6″–10″ long, very short-pedicelled; calyx canescent or short pubescent, about 3″ long in fruit, its three upper teeth obtuse or subacute.

In moist thickets or along marshes, New Brunswick to Ontario and Minnesota, south to Florida, Kansas, Texas and northern Mexico. Ascends to 2600 ft. in Virginia. June–Sept.

2. Teucrium occidentàle A. Gray. Hairy Germander. (Fig. 3071.)

Teucrium occidentale A. Gray, Syn. Fl. 2: Part 1, 349. 1878.

Perennial, villous or pubescent; stem erect, rather stout, usually much branched, 1°–3° high, the branches ascending. Leaves lanceolate or ovate-lanceolate, thin, acute or acuminate at the apex, sharply dentate, mostly rounded at the base, usually slender-petioled, 1′–3½′ long, ½′–1½′ wide; spikes dense, becoming 3′–8′ long in fruit; bracts lanceolate-subulate or the lower sometimes larger; calyx and axis of the spike villous-pubescent, the 3 upper calyx-teeth acute or acutish; corolla 4″–6″ long.

In moist soil, Ontario to eastern Pennsylvania, Wisconsin, Nebraska, New Mexico and California. Apparently intergrades with the preceding species. July–Sept.

3. ISÁNTHUS Michx. Fl. Bor. Am. 2: 3. *pl. 30.* 1803.

An annual erect finely viscid-pubescent much-branched herb, with narrow entire or few-toothed leaves, and small blue flowers in loose axillary cymes. Calyx broadly campanulate, 10-nerved, nearly equally 5-toothed, the teeth lanceolate. Corolla-tube not longer than the calyx, enlarged into the throat, the limb nearly equally 5-cleft into obovate somewhat spreading lobes. Stamens 4, didynamous, incurved-ascending, not longer than the corolla, the anterior pair slightly the longer; anther-sacs divergent at maturity. Ovary deeply 4-lobed; style minutely 2-cleft at the summit. Nutlets rugose-reticulated. [Greek, equal-flower, the corolla-lobes being nearly equal.]

A monotypic genus of eastern North America.

1. Isanthus brachiàtus (L.) B.S.P. False Pennyroyal. (Fig. 3072.)

Trichostema brachiatum L. Sp. Pl. 598. 1753.
Isanthus coeruleus Michx. Fl. Bor. Am. 2: 4. *pl. 30.* 1803.
I. brachiatus B.S.P. Prel. Cat. N. Y. 44. 1888.

Stem slender, much branched, 6′–20′ tall, the branches spreading. Leaves oblong or elliptic-lanceolate, acute at each end, entire, or with a few sharp teeth, 3-nerved, short-petioled, 1′–2′ long, 2″–6″ wide; axillary cymes 1–3-flowered; pedicels very slender, some of them as long as the fruiting calyx; calyx-lobes acute or acuminate, longer than or equalling the tube; corolla 2″–3″ long, the fruiting calyx 3″ long.

In sandy soil, especially along streams, Quebec and Ontario to Minnesota, south to Georgia and Texas. July–Sept.

4. TRICHOSTÈMA L. Sp. Pl. 598. 1753.

Annual or perennial erect branching herbs, some western species shrubby, with lanceolate oblong or linear entire or slightly repand leaves. Flowers small, or middle-sized, pink, blue, purple, or white, paniculate, or in axillary loose or dense cymes. Calyx campanulate, very unequally 5-lobed in our species, the lobes ovate or lanceolate. Corolla-tube slender, exserted or included, the limb somewhat oblique and deeply 5-cleft into oblong more or less declined segments. Stamens 4, didynamous, ascending, curved, the anterior pair the longer, the filaments filiform, spirally coiled in the bud, long-exserted; anther-sacs divaricate, more or less confluent at the base. Ovary deeply 4-lobed; style 2-cleft at the summit. Nutlets obovoid, reticulated. [Greek, hair-stamen, referring to the slender filaments.]

About 8 species, natives of North America.

Leaves oblong or lanceolate; plant minutely viscid-pubescent. 1. *T. dichotomum.*
Leaves linear; plant puberulent or glabrous. 2. *T. lineare.*

1. Trichostema dichótomum L. Blue Curls. Bastard Pennyroyal. (Fig. 3073.)

Trichostema dichotomum L. Sp. Pl. 598. 1753.

Annual, minutely viscid-pubescent; stem slender, rather stiff, much branched, 6′–2° high, the branches spreading or ascending. Leaves oblong or oblong-lanceolate, membranous, obtuse or subacute at the apex, narrowed at the base into short petioles, 1′–3′ long, 3″–10″ wide, the upper gradually smaller; flowers paniculate, 6″–9″ long, borne 1–3 together on 2-bractcolate peduncles; calyx oblique, very unequally 5-lobed, the 3 upper lobes much longer and more united than the 2 lower ones; corolla blue, pink or rarely nearly white, the limb longer than the tube; stamens blue or violet.

In dry fields, Maine to Florida, west to Pennsylvania, Kentucky and Texas. The lateral flowers become inverted by torsion of the pedicels. July–Oct.

2. Trichostema lineàre Nutt. Narrow-leaved Blue Curls. (Fig. 3074.)

T. brachiatum Lam. Encycl. 8: 84. 1808. Not L. 1753.
Trichostema lineare Nutt. Gen. 2: 39. 1818.

Puberulent or glabrous, not viscid or scarcely so; stem very slender, at length widely branched, 6′–18′ high, the branches ascending. Leaves linear, obtuse or subacute, sessile or very short-petioled, ½′–2′ long, 1″–2″ wide, sometimes with smaller ones or short leafy branches in their axil ; flowers very similar to those of the preceding species, sometimes larger.

In sandy fields and dry pine barrens, Connecticut and Long Island to Georgia and Louisiana, mostly near the coast. Slightly, but apparently constantly different from the preceding. July–Aug.

5. SCUTELLÀRIA L. Sp. Pl. 598. 1753.

Annual or perennial bitter herbs, some species shrubby. Flowers blue to violet, in terminal or axillary bracted mostly secund spike-like racemes, or solitary or 2–3 together in the axils. Calyx campanulate, gibbous, 2-lipped, the lips entire, the upper one with a crest or protuberance upon its back and often deciduous in fruit, the lower one persistent. Corolla much exserted, recurved-ascending, dilated above into the throat, glabrous within, the limb 2-lipped; upper lip arched, entire or emarginate; lower lip spreading or deflexed, its lateral lobes small and somewhat connected with the upper, its middle lobe broad, sometimes emarginate, the margins mostly recurved. Stamens 4, didynamous, all anther-bearing, ascending under the upper lip, the upper pair somewhat the shorter, their anthers 2-celled, ciliate; anthers of the lower pair of stamens 1-celled, also ciliate. Style unequally 2-cleft at the apex; ovary deeply 4-parted. Nutlets subglobose or depressed, papillose or tuberculate, borne on a short or elongated gynobase. [Latin, a dish, from the appendage to the fruiting calyx.]

About 100 species of wide geographic distribution. Besides the following, some 11 others occur in the southern and western parts of North America, all known as Skullcap, or Helmet-flower.

✲ Nutlets wingless, very slightly elevated on the short gynobase.

Flowers 3″–5″ long, in axillary and sometimes terminal racemes. — 1. *S. lateriflora.*
Flowers 6″–15″ long, in terminal often panicled racemes.
  Plant glabrous or very nearly so; leaves broad. — 2. *S. serrata.*
  Plants pubescent, puberulent or pilose.
    Leaves all except the floral crenate or dentate, broad.
      Canescent, not glandular; corolla canescent. — 3. *S. incana.*
      Densely glandular-pubescent; corolla puberulent. — 4. *S. cordifolia.*
      Pubescent below, glandular above; corolla nearly glabrous. — 5. *S. pilosa.*
    Leaves all except the lowest entire, narrow. — 6. *S. integrifolia.*
Flowers solitary in the axils or sometimes also in terminal bracted racemes.
  Annual, villous, branched from the base. — 7. *S. Drummondii.*
  Perennial from a thick woody root. — 8. *S. resinosa.*

Fibrous-rooted; perennial by rootstocks or stolons.
Flowers 2″–4″ long.
Plant glabrous, or slightly pubescent. 9. *S. parvula.*
Plant densely pubescent all over. 10. *S. campestris.*
Flowers 8″–13″ long.
Minutely and densely glandular-pubescent, resiniferous. 11. *S. Brittonii.*
Glabrous or merely slightly puberulent.
Leaves ovate, slender-petioled, cordate, obtuse. 12. *S. saxatilis.*
Leaves lanceolate or ovate-lanceolate, nearly sessile, acute. 13. *S. galericulata.*

* * Nutlets membranous-winged, elevated on the slender gynobase; flowers axillary. 14. *S. nervosa.*

1. Scutellaria lateriflòra L. Mad-dog Skullcap. (Fig. 3075.)

Scutellaria lateriflora L. Sp. Pl. 598. 1753.

Perennial by slender stolons, glabrous throughout or puberulent above; stem slender, leafy, erect or ascending, commonly branched, 8′–2° high. Leaves ovate, ovate-oblong or ovate-lanceolate, thin, slender-petioled, acute or acuminate at the apex, coarsely dentate-serrate, obtuse, rounded or subcordate at the base, 1′–3′ long, the upper gradually smaller, the uppermost sometimes entire; racemes narrow, secund, axillary or often also terminal and leafy-bracted, several–many-flowered; flowers 3″–5″ long; calyx short; corolla blue, varying to nearly white, its lips about equal, one-fifth as long as the tube; nutlets borne on a very short gynobase.

In wet places, Newfoundland to Ontario and British Columbia, south to Florida, New Mexico and Washington. July–Sept. Called also Madweed or Hoodwort.

2. Scutellaria serràta Andr. Showy Skullcap. (Fig. 3076.)

Scutellaria serrata Andr. Bot. Rep. *pl. 494.* 1809.
S. laevigata Aiken; Eaton, Man. Ed. 6, 333. 1833.

Perennial, glabrous, or puberulent above; stem slender, erect, simple or branched, 1°–2° high. Leaves ovate or elliptic, slender-petioled, acute at the apex, narrowed, or the lowest rounded or subcordate at the base, crenate or dentate, 2′–4′ long, the uppermost reduced to small floral bracts; racemes almost always simple and terminal, loosely flowered, the flowers opposite; fruiting calyx about 3″ long; corolla 1′ long, blue, minutely puberulent, its tube narrow, gradually expanded above into the throat, its rather narrow upper lip shorter than the lower; nutlets borne on a short gynobase.

In woods, southern New York and Pennsylvania to North Carolina, west to Illinois and Kentucky. One of the handsomest of the American species. Ascends to 3000 ft. in Virginia. May–June.

3. Scutellaria incàna Muhl. Downy Skullcap. (Fig. 3077.)

Scutellaria incana Muhl. Cat. 56. 1813.
Scutellaria canescens Nutt. Gen. 2: 38. 1818.
S. serrata Spreng. Syst. 2: 703. 1825. Not Andr. 1809.

Perennial, finely and densely whitish downy, or the upper surfaces of the leaves glabrous; stem rather strict, erect, usually much branched above, 2°–4° high. Leaves ovate, oval, or oblong, rather firm, slender-petioled, acute at the apex, crenate-dentate, narrowed, rounded or the lower subcordate at the base, 3′–4½′ long; racemes terminal, usually numerous and panicled, several–many-flowered; fruiting calyx 1½′–2′ long; corolla 9″–10″ long, canescent; upper lip of the corolla slightly longer than the lower; gynobase very short.

In moist woods and thickets, Ontario to Illinois, south to North Carolina and Alabama. June–Aug.

4. Scutellaria cordifòlia Muhl. Heart-leaved Skullcap. (Fig. 3078.)

Scutellaria cordifolia Muhl. Cat. 56. 1813.
Scutellaria versicolor Nutt. Gen. 2: 38. 1818.

Perennial, densely glandular-pubescent; stem erect, usually stout, 1°–3° high, often simple. Leaves prominently veined, slender-petioled, broadly ovate, crenate-dentate all around, 2′–4′ long, all but the uppermost cordate at the base; racemes terminal, narrow, solitary or panicled; bracts ovate, mostly entire, commonly longer than the pedicels; fruiting calyx nearly 3″ long; corolla puberulent, 10″–12″ long, blue with the lower side lighter or white, its tube narrow, its throat moderately dilated, its lateral lobes about as long as the upper lip; gynobase short.

In woods and thickets, especially along streams, Pennsylvania to Florida, west to Wisconsin, Arkansas and Texas. June–Aug.

5. Scutellaria pilòsa Michx. Hairy Skullcap. (Fig. 3079.)

Scutellaria pilosa Michx. Fl. Bor. Am. 2: 11. 1803.
Scutellaria ovalifolia Pers. Syn. 2: 136. 1807.

Perennial, stem slender, simple or branched, hairy or downy below, glandular-pubescent above, 1°–2½° high. Leaves ovate, oval, or oblong, petioled, obtuse, or the upper subacute at the apex, crenate, 1′–3′ long, narrowed or rounded at the base or the lower subcordate; racemes terminal, solitary or panicled, sometimes also in the upper axils; bracts oblong or spatulate, entire, longer than the pedicels; fruiting calyx about 3″ long; corolla blue, 6″–8″ long, minutely puberulent or glabrous, its lower lip and lateral lobes somewhat shorter than the arched upper one; gynobase short.

In dry sandy woods and thickets, southern New York and Pennsylvania to Michigan, Florida and Texas. Ascends to 4000 ft. in North Carolina. May–July.

Scutellaria pilòsa hirsùta (Short) A. Gray, Syn. Fl. 2: Part 1, 379. 1878.
S. hirsuta Short, Transyl. Journ. Med. 8: 582. 1836.
Stouter, sometimes 3° high, hirsute; leaves larger, coarsely crenate. Virginia and Kentucky.

6. Scutellaria integrifòlia L. Larger or Hyssop Skullcap. (Fig. 3080.)

Scutellaria integrifolia L. Sp. Pl. 599. 1753.
Scutellaria hyssopifolia L. Sp. Pl. 599. 1753.

Perennial, hoary with a minute down; stem slender, erect, rather strict, simple or branched, 6′–2° high. Leaves thin, linear to oblong, petioled, or the upper sessile, obtuse at the apex, entire, 1′–2′ long, 2″–6″ wide, or the lower ovate, lanceolate or nearly orbicular, obtuse and sometimes subcordate at the base, often crenate-dentate or incised; racemes solitary or several, terminal; bracts linear-oblong, subacute, longer than the pedicels; fruiting calyx 2″–3″ long; corolla blue or whitish underneath, 10″–15″ long, its large lips nearly equal; gynobase short.

In fields, woods and thickets, Connecticut and Rhode Island to West Virginia, south to Florida, Louisiana and Texas. Variable. May–Aug.

7. Scutellaria Drummóndii Benth. Drummond's Skullcap. (Fig. 3081.)

Scutellaria Drummondii Benth. Lab. Gen. & Sp. 441. 1834.

Annual, or perhaps biennial, from a rather deep straight root, villous-puberulent or pubescent, the branches 3′–8′ long. Leaves ovate, oblong, or obovate, entire, or the lower sparingly crenulate, 4″–12″ long, obtuse or acutish, narrowed at the base, the upper sessile, the lower petioled, the uppermost gradually smaller; flowers solitary in the axils, short-peduncled; fruiting calyx about 2″ long; corolla blue, or the tube nearly white, 4″–5″ long, pubescent, the lower lip violet, spotted, longer than the upper; gynobase short.

Kansas (according to Smyth), Texas and Mexico. April–June.

8. Scutellaria resinòsa Torr. Resinous Skullcap. (Fig. 3082.)

Scutellaria resinosa Torr. Ann. Lyc. N. Y. 2: 232. 1827.

Scutellaria Wrightii A. Gray, Proc. Am. Acad. 8: 370. 1872.

Perennial from a thick woody root, minutely canescent or puberulent and usually resiniferous; stems rather slender, rigid, tufted, leafy, ascending, 6′–10′ high. Leaves ovate, oval, or oblong, sessile, or the lower short-petioled, entire, obtuse at the apex, mostly narrowed at the base, 3″–6″ long; flowers solitary in the axils; fruiting calyx nearly 3″ long; corolla violet or nearly white, very pubescent, 6″–8″ long, its tube narrow and lips nearly equal; gynobase short.

On dry plains, Nebraska and Kansas to Texas. May–Aug.

9. Scutellaria pàrvula Michx. Small Skullcap. (Fig. 3083.)

Scutellaria parvula Michx. Fl. Bor. Am. 2: 11. 1803.

Scutellaria ambigua Nutt. Gen. 2: 37. 1818.

Glabrous, or sparingly puberulent, sometimes slightly glandular, perennial by slender tuberous-thickened rootstocks; stems erect or ascending, very slender, usually branched, 3′–12′ tall. Leaves ovate, oval or lanceolate, or the lower nearly orbicular, entire and sessile, or the lower sparingly dentate and petioled, 3″–12″ long; flowers solitary in the axils; fruiting calyx about 2″ long; corolla 2″–4″ long, violet, pubescent; gynobase short.

In moist sandy soil, Quebec to Ontario and Minnesota, south to New Jersey, Florida, Nebraska and Texas. April–July.

10. Scutellaria campéstris Britton. Prairie Skullcap. (Fig. 3084.)

Scutellaria parvula var. *mollis* A. Gray, Syn. Fl. 2: Part 1, 380. 1878. Not *S. mollis* R. Br.

Scutellaria campestris Britton, Mem. Torr. Club, 5: 283. 1894.

Pubescent, often densely so, perennial by tuberous thickened rootstocks. Stems diffuse, or ascending, branched, 4′–12′ long, rather stouter than those of the preceding species. Leaves ovate, or the lower almost orbicular, entire, or dentate, 5″–10″ long, obtuse at the apex, rounded or truncate at the base, the lower short-petioled, the upper sessile; flowers solitary in the axils; corolla 3″–5″ long, violet or purple, pubescent; gynobase short.

In dry sandy or gravelly soil, North Carolina to Illinois, Iowa and the Indian Territory. April–July.

11. Scutellaria Brittònii Porter. Britton's Skullcap. (Fig. 3085.)

Scutellaria resinosa A. Gray, Syn. Fl. 2: Part 1, 381. 1878. Not Torr. 1827.

Scutellaria Brittonii Porter, Bull. Torr. Club, 21: 177. 1894.

Perennial by tuberous-thickened rootstocks, viscidly glandular, pubescent or puberulent, branched from the base; stems erect, 4′–8′ high, leafy. Leaves oblong or oval, sessile and entire or the lowest short-petioled and slightly crenulate, obtuse at the apex, rather prominently veined on the lower surface, 6″–12″ long, the upper scarcely smaller; flowers solitary in the axils; pedicels mostly shorter than the calyx; corolla pubescent, blue, 10″–15″ long, the tube narrow below, enlarged above into the throat; gynobase short.

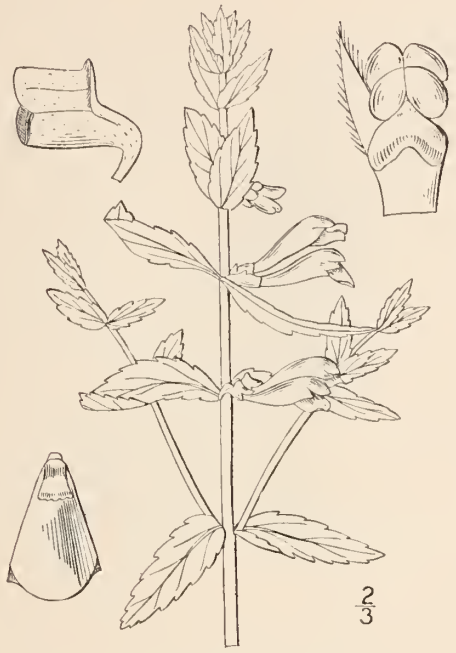
Nebraska (according to Coulter), Colorado and Wyoming. June–July.

12. Scutellaria saxátilis Riddell. Rock Skullcap. (Fig. 3086.)

Scutellaria saxatilis Riddell, Suppl. Cat. Pl. Ohio, 14. 1836.

Perennial by filiform stolons, glabrate or sparingly puberulent; stem slender, weak, ascending or reclining, simple or branched, 6′–12′ long. Leaves ovate, slender-petioled, thin, coarsely crenate, obtuse at the apex, cordate at the base, 1′–2′ long, or the lower nearly orbicular, and the upper lanceolate, subacute and entire; flowers solitary in the upper axils, or clustered in a terminal leafy-bracted loose raceme; bracts longer than the pedicels; fruiting calyx about 2″ long; corolla light blue, very nearly glabrous, 8″–10″ long; gynobase short.

On moist banks and in thickets, Delaware to southern Virginia, west to Ohio and Tennessee. Ascends to 3000 ft. in Virginia. May–July.



13. Scutellaria galericulàta L. Hooded Willow-herb. Marsh Skullcap. (Fig. 3087.)

Scutellaria galericulata L. Sp. Pl. 599. 1753.

Perennial by filiform stolons, not tuber-bearing, puberulent or pubescent; stem erect, usually branched, 1°–3° high. Leaves oblong-lanceolate to ovate-oblong, thin, short-petioled, or the upper sessile, acute at the apex, dentate with low teeth or the upper entire, subcordate or rounded at the base, 1′–2½′ long, the uppermost usually much smaller and bract-like; flowers solitary in the axils; peduncles shorter than the calyx; corolla blue, puberulent, nearly or quite 1′ long, with a slender tube and slightly enlarged throat; gynobase short.

In swamps and along streams, Newfoundland to Alaska, south to New Jersey, the mountains of North Carolina, Ohio, Nebraska, Arizona and Washington. Also in Europe and Asia. June–Sept.

14. Scutellaria nervòsa Pursh. Veined Skullcap. (Fig. 3088.)

Scutellaria nervosa Pursh, Fl. Am. Sept. 412. 1814.
Scutellaria teucriifolia J. E. Smith in Rees' Cycl. 32: no. 15. 1816.

Perennial by filiform stolons; stem glabrous or sparingly pubescent, erect, slender, simple or sometimes branched, 8′–2° high. Leaves thin, glabrous, or sometimes decidedly pubescent, the lower slender-petioled, nearly orbicular, crenate, often subcordate at the base, the middle ones larger, ovate, 1′–2′ long, sessile or nearly so, obtuse or acute, coarsely dentate or crenate, the upper lanceolate or ovate-lanceolate, acute, commonly entire; flowers solitary in the axils; fruiting calyx about 2″ long; corolla blue, 4″–5″ long, puberulent, the lower lip longer than the concave upper one; nutlets membranous-winged, borne on a slender gynobase.

In moist woods and thickets, New York and New Jersey to Illinois, south to North Carolina and Missouri. Ascends to 3000 ft. in Virginia. May–Aug.

6. MARRÙBIUM L. Sp. Pl. 582. 1753.

Perennial branching mostly woolly herbs, with petioled dentate rugose leaves, and small white or purplish flowers in dense axillary clusters. Calyx tubular, 5–10-nerved, regularly 5–10-toothed, the teeth nearly equal, or the alternate ones shorter, acute or aristate, spreading or recurved in fruit. Corolla-limb 2-lipped, the upper lip erect, entire or emarginate, the lower spreading, 3-cleft, its broader middle lobe commonly emarginate. Stamens 4, didynamous, included, the posterior pair the shorter; anthers 2-celled, the sacs divergent. Style 2-cleft at the summit, the lobes short. Ovary deeply 4-lobed. Nutlets ovoid, smooth. [Name Middle Latin, its meaning uncertain.]

About 40 species, natives of the Old World.

1. Marrubium vulgàre L. White Hoarhound. (Fig. 3089.)

Marrubium vulgare L. Sp. Pl. 583. 1753.

Stem erect, stout, woolly, especially below, 1°–3° high, the branches ascending. Leaves oval, broadly ovate or nearly orbicular, rugose-veined, obtuse at the apex, crenate-dentate, rounded, narrowed or subcordate at the base, 1′–2′ long, rough, whitish above, woolly beneath; petioles ½′–1′ long, usually exceeding the flowers; clusters all axillary, densely many-flowered; flowers whitish; calyx-teeth usually 10, subulate, more or less recurved, glabrous above, woolly below.

In waste places, Maine and Ontario to Minnesota and British Columbia, North Carolina, Tennessee, Texas and Mexico. Naturalized from Europe. Native also of Asia. Old names, Houndbene, Marrube, Marvel.

AGÁSTACHE Clayt.; Gron. Fl. Virg. 88. 1762.

[Vleckia Raf. Med. Rep. (II.) 5: 308. 1808.]

[Lophanthus Benth. Bot. Reg. 15: under *pl. 1282.* 1829. Not Adans. 1763.]

Tall erect perennial herbs, with serrate, mainly ovate, petioled leaves, and yellowish purplish or blue flowers, verticillate-clustered in thick dense or interrupted bracted terminal spikes. Calyx narrowly campanulate, somewhat oblique, slightly 2-lipped, 5-toothed, the teeth of the upper lip somewhat larger than those of the lower, or all about equal. Corolla strongly 2-lipped, the tube as long as the calyx; upper lip erect, 2-lobed; lower lip spreading, 3-lobed, its middle lobe broader than the lateral ones and crenulate. Stamens 4, all anther-bearing, didynamous, the upper pair the longer; anthers 2-celled, their sacs nearly parallel. Ovary deeply 4-parted; style 2-cleft at the summit. Nutlets ovoid, smooth. [Greek, many spikes.]

About 4 species, natives of North America. Besides the following, another occurs in the western part of the United States.

Glabrous or very nearly so, stout; corolla greenish-yellow. 1. *A. nepetoides.*
Pubescent, stout; corolla purplish; leaves green both sides. 2. *A. scrophulariaefolia.*
Glabrous or slightly pubescent, slender; corolla blue; leaves pale beneath. 3. *A. anethiodora.*

1. Agastache nepetoìdes (L.) Kuntze. Catnep Giant-Hyssop. (Fig. 3090.)

Hyssopus nepetoides L. Sp. Pl. 569. 1753.
Lophanthus nepetoides Benth. Bot. Reg. under *pl. 1282.* 1829.
Vleckia nepetoides Raf. Fl. Tell. 3: 89. 1836.
A. nepetoides Kuntze, Rev. Gen. Pl. 511. 1891.

Glabrous, or slightly puberulent; stem stout, 2°–5° high, branched, at least above. Leaves ovate or ovate-oblong, acuminate or acute at the apex, rounded, cordate or the upper narrowed at the base, mostly thin, coarsely dentate, 2′–6′ long; spikes 3′–18′ long, usually very dense; petioles of the lowest leaves often 2′ long; bracts ovate, acute or acuminate; calyx-teeth oblong or ovate-oblong, obtuse or subacute, sometimes purplish; corolla greenish yellow, about 4″ long, scarcely exceeding the calyx.

In woods and thickets, Vermont and Ontario to Wisconsin, south to Georgia and Kentucky. July–Sept.

2. Agastache scrophulariaefòlia (Willd.) Kuntze Figwort Giant-Hyssop. (Fig. 3091.)

Hyssopus scrophulariaefolius Willd. Sp. Pl. 3: 48. 1801.
Lophanthus scrophulariaefolius Benth. Bot. Reg. under *pl. 1282.* 1829.
Vleckia scrophulariaefolia Raf. Fl. Tell. 3: 89. 1836.
Agastache scrophulariaefolia Kuntze, Rev. Gen. Pl. 511. 1891.

Similar to the preceding species, but commonly taller, the stem, petioles and lower surfaces of the leaves more or less pubescent. Leaves nearly identical with those of *V. nepetoides* in size and outline; spike sometimes interrupted, 3′–18′ long; bracts broadly ovate, abruptly acuminate; calyx-teeth lanceolate or ovate-lanceolate, very acute or sometimes acuminate, whitish or purplish; corolla purplish, 5″–6″ long, considerably exceeding the calyx.

In woods and thickets, Connecticut to Wisconsin, south to North Carolina and Kentucky. Plant strong-scented. July–Oct.

3. Agastache anethiodòra (Nutt.) Britton. Fragrant Giant-Hyssop. (Fig. 3092.)

Hyssopus anethiodorus Nutt. Fras. Cat. 1813.
Hyssopus anisatus Nutt. Gen. 2: 27. 1818.
Lophanthus anisatus Benth. Bot. Reg. under *t. 1282* 1829.
Vleckia anisata Raf. Fl. Tell. 3: 89. 1836.
Vleckia anethiodora Greene, Mem. Torr. Club, 5, 282. 1894.

Glabrous, or minutely puberulent; stem rather slender, leafy, usually brauched, 2°–4° high. Leaves ovate or triangular-ovate, firm, mostly short-petioted, acute or acuminate at the apex, truncate, obtuse or sometimes subcordate at the base, sharply serrate, green above, pale and appearing glaucous beneath, 2′–3′ long, anise-scented; spikes dense or interrupted, seldom 6′ long; bracts broadly ovate, abruptly acuminate; calyx-teeth ovate to lanceolate, acute, purple; corolla blue, 4″–5″ long, somewhat exceeding the calyx.

On prairies and plains, Minnesota to the Northwest Territory, south to Illinois and Nebraska. July–Sept.

8. MEEHÁNIA Britton, Bull. Torr. Club, 21: 32. 1894.

A low pubescent spreading or decumbent herb, with long-petioled cordate leaves, trailing leafy stolous, and large blue flowers in terminal secund bracted spikes. Calyx campanulate, 15-nerved, slightly 2-lipped, its teeth all lanceolate, acute, the 3 upper louger than the 2 lower. Corolla much exserted, puberulent without, pubescent within, the tube narrow at the base, gradually widely ampliate into the throat, the limb 2-lipped; upper lip 2-lobed, arched, the lobes ovate, obtuse; lower lip about equalling the upper, spreading, 3-lobed, the middle lobe emarginate, broader than the lateral ones. Stamens 4, didynamous, all anther-bearing, included, ascending under the upper lip, the upper pair louger than the lower; anthers 2-celled, the sacs uearly parallel. Ovary deeply 4-lobed; style equally 2-cleft at the summit. Nutlets obloug, smooth. [Named for Thomas Mechan, of Philadelphia, botanist aud horticulturist.]

A monotypic genus of eastern North America.

1. Meehania cordàta (Nutt.) Britton. Meehania. (Fig. 3093.)

Dracocephalum cordalum Nutt. Gen. 2: 35. 1818.
Cedronella cordata Benth. Lab. 502. 1834.
Meehania cordata Britton, Bull. Torr. Club, 21: 33. *pl. 173.* 1894.

Flowering stems ascending, 3′–8′ high; stolons very slender, leafy throughout, sometimes 2° long. Leaves all broadly ovate or ovate-orbicular, thin, obtuse or subacute at the apex, crenate all around, cordate at the base, sparingly pubescent with scattered hairs on both surfaces, or nearly glabrous beneath, green on both sides, 1′–2′ long, the basal sinus broad; spikes 1′–4′ long; bracts ovate or oblong, acute, membranous, the lower sometimes crenulate and surpassing the calyx; bractlets small, lanceolate; calyx about 5″ long, puberulent, its longer teeth about one-half the length of the tube; corolla 1′–1¼′ long, showy.

In rich moist woods and thickets, southwestern Pennsylvania to Tennessee and North Carolina. May–July.

9. NÉPETA L. Sp. Pl. 570. 1753.

Herbs, with dentate or incised leaves, and mostly white or blue rather small flowers in verticillate clusters, usually crowded in terminal spikes, or axillary and cymose. Calyx tubular, somewhat oblique at the mouth, 15-nerved, usually incurved, 5-toothed, scarcely 2-lipped, but the upper teeth usually longer than the lower. Corolla-tube enlarged above, the limb strongly 2-lipped; upper lip erect, entire, emarginate or 2-lobed; lower lip spreading, 3-lobed, the middle lobe larger than the lateral ones. Stamens 4, all anther bearing, didynamous, ascending under the upper lip, the lower pair the shorter; anthers 2-celled, the sacs divaricate. Ovary deeply 4-parted; style 2-cleft at the summit. Nutlets ovoid, compressed, smooth. [Ancient Latin name of catnep.]

About 150 species, natives of Europe and Asia.

1. Nepeta Catària L. Catmint. Catnep. Nep. (Fig. 3094.)

Nepeta Cataria L. Sp. Pl. 570. 1753.

Perennial, densely tomentulose-canescent, pale green; stem rather stout, erect, branched, 2°–3° high, the branches straight, ascending. Leaves ovate to oblong, petioled, acute at the apex, coarsely crenate-dentate, mostly cordate at the base, 1′–3′ long, greener above than beneath; flower-clusters spiked at the ends of the stem and branches, the spikes 1′–5′ long; bracts small, foliaceous; bractlets subulate; calyx densely puberulent, its teeth subulate, the upper about one-half the length of the tube; corolla nearly white, or pale purple, dark-dotted, puberulent without, 5″–6″ long, its tube a little longer than the calyx, the broad middle lobe of its lower lip crenulate.

In waste places, New Brunswick and Quebec to Minnesota, south to Virginia and Kansas. Naturalized from Europe. Native also of Asia. July–Nov.

10. GLECÒMA L. Sp. Pl. 578. 1753.

Low diffuse creeping herbs, with long-petioled nearly orbicular or reniform crenate leaves, and rather large blue or violet flowers in small axillary verticillate clusters. Calyx oblong-tubular, 15-nerved, oblique at the throat, not 2-lipped, unequally 5-toothed. Corolla-tube exserted, enlarged above, the limb 2-lipped; upper lip erect, 2-lobed or emarginate; the lower lip spreading, 3-lobed, the middle lobe broad, emarginate, the side lobes small. Stamens 4, didynamous, all anther-bearing, ascending under the upper lip of the corolla,

not exserted, the upper pair the longer; anther-sacs divergent. Ovary deeply 4-parted. Nutlets ovoid, smooth. [Greek name for thyme, or pennyroyal.]

About 6 species of Europe and Asia.

1. Glecoma hederàcea L. Ground Ivy. Gill-over-the-Ground. Field Balm. (Fig. 3095.)

Glecoma hederacea L. Sp. Pl. 578. 1753.
N. Glechoma Benth. Lab. Gen. & Sp. 485. 1834.
N. hederacea B.S.P. Prel. Cat. N. Y. 43. 1888.

Perennial, pubescent, the creeping stems leafy, sometimes 18′ long, the branches ascending. Lower petioles commonly longer than the leaves; leaves green both sides, ½′–1½′ in diameter; clusters few-flowered, the flowers 7″–10″ long, short-pedicelled; bractlets subulate, shorter than the calyx; calyx puberulent, its teeth acute or lanceolate-acuminate, about one-third as long as the tube; corolla-tube 2–3 times as long as the calyx; upper pair of stamens much longer than the lower.

In waste places, woods and thickets, Newfoundland to Ontario and Minnesota, south to Georgia and Kansas. Old names, Alehoof, Cat's-foot, Gill, Gill-ale, Gill-go-by-the-ground, Hayhofe, Haymaids, Hove, Tunhoof, Creeping Charlie. March-May.

11. DRACOCÉPHALUM L. Sp. Pl. 594. 1753.

Perennial herbs, with dentate entire or incised leaves, and blue or purple flowers in axillary and terminal bracted clusters, the bracts pectinate in our species. Calyx tubular, 15-nerved, straight or incurved, 5-toothed, the upper tooth much larger than the others, or 2-lipped with the 3 upper teeth more or less united. Corolla expanded above, its limb 2-lipped; upper lip erect, emarginate; lower lip spreading, 3-lobed, the middle lobe larger than the lateral ones, sometimes 2-cleft. Stamens 4, didynamous, ascending under the upper lip, the upper pair longer than the lower; anthers 2-celled, the sacs divaricate; style 2-cleft at the summit; ovary deeply 4-parted. Nutlets ovoid, smooth. [Greek, dragon-head.]

About 35 species, natives of the northern hemisphere. Only the following are known in North America.

Corolla scarcely exceeding the calyx; clusters mostly terminal, dense. 1. *D. parviflorum.*
Corolla 2–3 times as long as the calyx; clusters mostly axillary. 2. *D. Moldavica.*

1. Dracocephalum parviflòrum Nutt. American Dragon-head. (Fig. 3096.)

D. parviflorum Nutt. Gen. 2: 35. 1818.

Annual or biennial, somewhat pubescent, or glabrous; stem rather stout, usually branched, 6′–2° high. Leaves lanceolate, ovate, or oblong, slender petioled, serrate, or the lower incised, acute or obtuse at the apex, rounded or narrowed at the base, thin, 1′–3′ long; clusters dense, many-flowered, crowded in dense terminal spikes, and sometimes also in the upper axils; bracts ovate to oblong, pectinate with awn-pointed teeth, shorter than or equalling the calyx; pedicels 1″–2″ long; upper tooth of the calyx ovate-oblong, longer than the narrower lower and lateral ones, all acuminate; corolla light blue, scarcely longer than the calyx.

In dry gravelly or rocky soil, northern New York and Ontario to Minnesota and Alaska, south in the Rocky Mountains to Arizona and New Mexico. May-Aug.

2. Dracocephalum Moldávica L. Moldavian Dragon-head. (Fig. 3097.)

Dracocephalum Moldavica L. Sp. Pl. 595. 1753.

Annual, pubcrulent; stem erect, usually widely branched, 1°–2½° high. Leaves oblong or linear-oblong, dentate or somewhat incised, obtuse at the apex, usually narrowed at the base, 1′–2′ long, 2″–6″ wide; clusters loose, few-flowered, commonly numerous, mostly axillary; bracts narrowly oblong, usually shorter than the calyx, deeply pectinate with aristate teeth; pedicels 2″–4″ long; calyx slightly curved, the 2 lower teeth somewhat shorter than the 3 broader equal upper ones; corolla 2-3 times as long as the calyx.

In a cañon near Spring View, Neb. Also in northern Mexico. Introduced from central Europe. June–Aug.

12. PRUNÉLLA L. Sp. Pl. 600. 1753.

Pereunial simple or sometimes branched herbs, with petioled leaves, and rather small clustered purple or white flowers, in terminal and sometimes also axillary dense bracted spikes or heads. Calyx oblong, reticulate-veined, about 10-nerved, deeply 2-lipped, closed in fruit; upper lip nearly truncate, or with 3 short teeth; lower lip 2-cleft, its teeth lanceolate. Corolla-tube inflated, slightly narrowed at the mouth, its limb strongly 2-lipped; upper lip entire, arched; lower lip spreading, 3-lobed. Stamens 4, didynamous, ascending under the upper lip of the corolla, the lower pair the longer; filaments of the longer stamens 2-toothed at the summit, one of the teeth bearing the anther, the other sterile; anthers 2-celled, the sacs divergent or divaricate. Ovary deeply 4-parted. Nutlets ovoid, smooth. [Origin of name doubtful; often spelled *Brunella*, the pre-Linnaean form.]

About 5 species, of wide geographic distribution. Only the following occur in North America.

Leaves entire or crenate. 1. *P. vulgaris.*
Leaves pinnatifid or deeply incised. 2. *P. laciniata.*

1. Prunella vulgàris L. Self-heal. Heal-all. (Fig. 3098.)

Prunella vulgaris L. Sp. Pl. 600. 1753.

Pubescent or nearly glabrous; stem slender, procumbent or ascending or erect, usually simple, but sometimes considerably branched, 2′–2° high. Leaves ovate, oblong or oblong-lanceolate, obtuse or subacute at the apex, usually narrowed at the base, rather thin, entire or crenate, 1′–4′ long, the lowest commonly shorter and sometimes subcordate; spikes terminal, sessile or short-peduncled, very dense, ½′–1′ long in flower, becoming 2′–4′ long in fruit; bracts broadly ovate-orbicular, cuspidate, more or less ciliate; corolla violet, purple, or sometimes white, 4″–6″ long, about twice as long as the purplish or green calyx; calyx-teeth often ciliate.

In fields, woods and waste places throughout nearly the whole of North America. Naturalized from Europe. Native also of Asia. Possibly native in northern British America. Other names are Thimble-flower, All-heal, Brownwort, Carpenter's-herb, Hook-heal, Heart-of-the-earth, Sicklewort, Blue-curls. May-Oct.

2. Prunella laciniàta L. Cut-leaved Self-heal. (Fig. 3099.)

Prunella vulgaris var. *laciniata* L. Sp. Pl. 600. 1753.

Prunella laciniata L. Sp. Pl. Ed. 2, 837. 1763.

Brunella vulgaris var. *pinnatifida* Benth. in DC. Prodr. 12: 411. 1848.

Similar to the preceding species, but the stem leaves pinnatifid, lobed, or incised, the basal ones often entire or merely crenulate.

Vicinity of Washington, D. C. Adventive or fugitive from Europe. Regarded by many authors as a variety of *P. vulgaris*, but the pinnatifid leaves appear to be a constant character. Summer.

13. PHYSOSTÈGIA Benth. Lab. Gen. & Sp. 504. 1834.

Erect perennial glabrous or puberulent herbs, with serrate dentate or entire leaves, and large or middle-sized bracted purple violet, pink or white flowers in terminal spikes, or spike-like racemes. Calyx campanulate or oblong, membranous, swollen and remaining open in fruit, faintly reticulate-veined and 10-nerved, equally 5-toothed. Corolla much longer than the calyx, its tube gradually much enlarged upward, its limb strongly 2-lipped; upper lip concave, rounded, entire; lower lip spreading, 3-lobed, the middle lobe commonly emarginate. Stamens 4, didynamous, ascending under the upper lip of the corolla, the lower pair the longer; filaments pubescent; anthers all alike, 2-celled, the sacs nearly parallel, the margins of their valves commonly spinulose or denticulate. Ovary 4-parted. Nutlets ovoid-triquetrous, smooth. [Greek, bellows-covering, from the inflated fruiting calyx.]

About 5 species, natives of North America, known as False Dragon-head or Lion's-heart.

Flowers 1′ long, or more; leaves firm.
- Spike dense, many-flowered; leaf-serrations very acute. — 1. *P. Virginiana.*
- Spike loose, few-flowered; leaf-serrations blunt. — 2. *P. denticulata.*

Flowers 5″–7″ long; leaves thin.
- Spike loose; 4′–8′ long; leaves few and distant. — 3. *P. intermedia.*
- Spike dense, 1′–4′ long; stem leafy. — 4. *P. parviflora.*

1. Physostegia Virginiàna (L.) Benth. False Dragon-head. Obedient Plant. Lion's Heart. (Fig. 3100.)

D. Virginianum L. Sp. Pl. 594. 1753.

Dracocephalum speciosum Sweet, Brit. Fl. Gard. *pl. 93.* 1825.

P. Virginiana Benth. Lab. Gen. & Sp. 504. 1834.

Stem erect or ascending, rather stout, simple or branched above, 1°–4° tall. Leaves firm, lanceolate, oblong-lanceolate, or linear-lanceolate, acuminate at the apex, sharply serrate or serrulate, narrowed at the base, the upper all sessile, 2′–5′ long, 2″–7″ wide, the lowest petioled; bracts lanceolate, shorter than the calyx; spikes dense, becoming 4′–8′ long in fruit, many-flowered; flowering calyx campanulate or somewhat turbinate, its teeth ovate, acute, about one-half as long as the tube; fruiting calyx oblong, 4″–5″ long, the teeth much shorter than the tube; corolla pale purple or rose, 1′ long or more, often variegated with white, temporarily remaining in whatever position it is placed.

In moist soil, Quebec to the Northwest Territory, south to Florida, Louisiana and Texas. Perhaps escaped from gardens eastward. July–Sept.

2. **Physostegia denticulàta** (Ait.) Britton. Few-flowered Lion's Heart. (Fig. 3101.)

Prasium purpureum Walt. Fl. Car. 166. 1788?
Dracocephalum denticulatum Ait. Hort. Kew. 2: 317. 1789.
Physostegia Virginiana var. *denticulata* A. Gray, Syn. Fl. 2: Part 1, 383. 1878.
Physostegia denticulata Britton Mem. Torr. Club, 5: 284. 1894.

Stem slender, ascending or erect, simple, or little branched, 1°–2° high. Leaves firm or rather thin, oblong, linear-oblong, or oblanceolate, obtuse or acute at the apex, narrowed at the base, crenulate, obtusely dentate, or entire, 1′–3′ long, 2″–6″ wide, the upper sessile, the lower slender-petioled; spike loosely few–several-flowered; bracts lanceolate, little longer than the fruiting pedicels; flowering calyx oval-campanulate, its teeth acute, about one-third as long as the tube; fruiting calyx oblong, 3″–4″ long; corolla rose-pink, nearly or quite 1′ long.

In moist soil, Virginia to Florida and Texas. June–Aug.

3. **Physostegia intermèdia** (Nutt.) A. Gray. Slender Lion's Heart. (Fig. 3102.)

Dracocephalum intermedium Nutt. Trans. Am. Phil. Soc. (II.) 5: 187. 1833–37.
Physostegia intermedia A. Gray, Proc. Am. Acad. 8: 371. 1872.

Stem very slender, usually quite simple, 1°–3° high. Leaves usually few pairs, remote, thin, mostly shorter than the internodes, narrowly lanceolate or linear, acute or acuminate at the apex, repand-denticulate, little narrowed at the base, all sessile, or the lowest petioled, 2′–3′ long, 2″–4″ wide; spikes very slender, remotely many-flowered, 4′–8′ long in fruit; lower bracts often nearly as long as the campanulate calyx; calyx-teeth acute, shorter than the tube; fruiting calyx broadly oval, 2″–2½″ long; corolla much dilated above, 5″–7″ long.

On prairies, western Kentucky (according to Gray), Louisiana, Arkansas and Texas. May–July.

4. **Physostegia parviflòra** Nutt. Purple or Western Lion's Heart. (Fig. 3103.)

Physostegia parviflora Nutt.; Benth. in DC. Prodr. 12: 434. As synonym. 1848.

Stem rather stout, usually simple, 1°–3° high, Leaves lanceolate, oblong-lanceolate, or ovate-lanceolate, acute, acuminate or the lower obtuse at the apex, sharply serrate or dentate, somewhat narrowed at the base, all sessile or the lowest petioled, 3′–4′ long, 3″–10″ wide; spikes densely several–many-flowered, 1′–4′ long; bracts ovate or ovate-lanceolate, acute, shorter than the calyx; flowering calyx campanulate, its teeth ovate, obtuse or subacute, about one-third as long as the tube; fruiting calyx globose-oblong, 2″–3″ long; corolla purple, 6″ long.

In moist soil, Minnesota to Nebraska, west to British Columbia and Oregon. June–Aug.

14. SYNÁNDRA Nutt. Gen. 2: 29. 1818.

An annual or biennial, somewhat hirsute, simple or little branched herb, with long-petioled ovate cordate crenate leaves, and large white flowers in a terminal leafy-bracted spike. Calyx campanulate-oblong, membranous, deeply 4-cleft, inflated in fruit, faintly and irregularly veined, the lobes narrowly lanceolate, the two upper shorter than the lower. Corolla much longer than the calyx, its tube narrow below, much expanded above, 2-lipped; upper lip concave, entire; lower lip spreading, 3-lobed. Stamens 4, didynamous, ascending under the upper lip of the corolla; filaments villous; anthers glabrous, 2-celled, the sacs divaricate, the contiguous ones of the upper pair of stamens sterile and connate. Ovary deeply 4-lobed; style unequally 2-cleft at the summit. Nutlets ovoid, smooth, sharply angled. [Greek, stamens-together.]

A monotypic genus of southeastern North America.

1. Synandra hispídula (Michx.) Britton. Synandra. (Fig. 3104.)

Lamium hispidulum Michx. Fl. Bor. Am. 2: 4. 1803.
Synandra grandiflora Nutt. Gen. 2: 29. 1818.
Torreya grandiflora Raf. Am. Month. Mag. 3: 356. 1818.
S. hispidula Britton, Mem. Torr. Club. 5: 285. 1894.

Stem rather slender, erect or ascending, weak, 1°–2½° long, striate. Leaves thin, the lower and basal ones broadly ovate, or nearly orbicular, palmately veined, acute or obtuse at the apex, deeply cordate at the base, the blade 2′–4′ long, and commonly shorter than the petiole; floral leaves sessile, ovate or ovate-lanceolate, acute or acuminate, the flowers solitary in their axils, the uppermost leaves very small; calyx hirsute, its lobes about as long as the tube; corolla 1′–1½′ long, showy, the lower lip with purple lines.

Along streams and in wet woods, Ohio and Illinois to southwestern Virginia and Tennessee. Ascends to 3500 ft. in Virginia. May–June.

15. PHLÒMIS L. Sp. Pl. 584. 1753.

Tall perennial herbs, or shrubs. Calyx tubular or tubular-campanulate, 5–10-nerved, the limb mostly equally 5-toothed. Corolla-tube usually with a woolly ring within, shorter than or exceeding the calyx, the limb strongly 2-lipped; upper lip erect, concave, arched or sometimes keeled, entire or emarginate; lower lip spreading, 3-cleft. Stamens 4, didynamous, ascending under the upper lip of the corolla, the anterior pair the longer and their filaments with hooked appendages at the base; anther-sacs divergent. Ovary deeply 4-lobed; style subulate, 2-cleft at the summit, one of the lobes smaller than the other. Nutlets ovoid, glabrous, or pubescent above. [Greek, mullen, in allusion to the thick woolly leaves of some species.]

About 50 species, natives of the Old World.

1. Phlomis tuberòsa L. Jerusalem Sage. (Fig. 3105.)

Phlomis tuberosa L. Sp. Pl. 586. 1753.

Herbaceous from a thickened root; stem stout, purplish, glabrous or loosely pubescent above, usually much branched, 3°–6° tall, the branches nearly erect. Lower leaves triangular-ovate, long-petioled, acuminate or acute at the apex, coarsely dentate or incised-dentate, rather thick, deeply cordate at the base, strongly veined, 5′–10′ long, 3′–6′ wide; upper leaves lanceolate, short-petioled or sessile, truncate or sometimes narrowed at the base, the uppermost (floral) very small; clusters densely many-flowered; bractlets subulate, ciliate-hirsute or nearly glabrous; calyx 5″–6″ long, its teeth setaceous with a broader base, spreading; corolla 10″–12″ long, pale purple or white, twice as long as the calyx, densely pubescent, and the margins of its upper lip fringed with long hairs.

In waste places, south shore of Lake Ontario. Naturalized from southern Europe. June–Sept.

16. GALEÓPSIS L. Sp. Pl. 579. 1753.

Erect annual branching herbs, with broad or narrow leaves, and rather small yellow red purple or mottled verticillate-clustered flowers in the upper axils, or forming terminal dense or interrupted spikes. Calyx campanulate or tubular-campanulate, 5–10-nerved, 5-toothed, the teeth nearly equal, spinulose. Corolla-tube narrow, the throat expanded, the limb strongly 2-lipped; upper lip erect, concave, entire; lower lip spreading, 3-cleft, the middle lobe obcordate or emarginate. Stamens 4, didynamous, ascending under the upper lip of the corolla, the anterior pair the longer; anthers 2-celled, the sacs transversely 2-valved, the inner valve ciliate, the outer smooth, larger. Ovary deeply 4-parted; style 2-cleft at the summit. Nutlets ovoid, slightly flattened, smooth. [Greek, weasel-like.]

About 6 species, natives of Europe and Asia.

Plant puberulent; leaves linear or lanceolate. 1. *G. Ladanum.*
Plant hispid; leaves ovate. 2. *G. Tetrahit.*

1. Galeopsis Ládanum L. Red Hemp-Nettle. Ironwort. (Fig. 3106.)

Galeopsis Ladanum L. Sp. Pl. 579. 1753.

Puberulent; stem slender, erect, much branched, 6′–18′ high, the branches ascending. Leaves linear, oblong, or lanceolate, mostly short-petioled, acute at both ends, dentate, or nearly entire, 1′–2′ long, 2″–8″ wide; flower-clusters mainly axillary, distant; calyx-teeth subulate-lanceolate, shorter than or equalling the tube; corolla 6″–8″ long, red or purple to white and variegated, twice the length of the calyx.

In waste places and on ballast, New Brunswick to Michigan and New Jersey. Adventive or naturalized from Europe. Native also of Asia. July–Oct.

2. Galeopsis Tetràhit L. Hemp-Nettle. Hemp Dead Nettle. (Fig. 3107.)

Galeopsis Tetrahit L. Sp. Pl. 579. 1753.

A coarse and rough-hairy herb, the stem rather stout, branched, 1°–3° high, swollen under the joints. Leaves ovate, membranous, slender-petioled, acuminate at the apex, rounded or narrowed at the base, coarsely dentate, 2′–5′ long, ½′–2½′ wide; flower-clusters axillary, dense, or in a short leafy-bracted spike; calyx-teeth needle-pointed, bristly, as long as or longer than the tube; corolla 8″–12″ long, pink or pale purple variegated with white, about twice the length of the calyx.

In waste places, Newfoundland to British Columbia and Alaska, south to North Carolina and Michigan. Naturalized from Europe. Native also of Asia. Old names, Bee-, Dog-, or Blind-nettle, Stinging Nettle, Nettle-, Wild-, or Bastard-hemp. June–Sept.

17. LEONÙRUS L. Sp. Pl. 584. 1753.

Tall erect herbs, with palmately cleft, parted or dentate leaves, and small white or pink flowers verticillate in dense axillary clusters. Calyx tubular campanulate, 5-nerved, nearly regular and equally 5-toothed, the teeth rigid, subulate or aristate. Tube of the corolla included or slightly exserted, its limb 2-lipped; upper lip erect, concave or nearly flat, entire; lower lip spreading or deflexed, 3-lobed, the middle lobe broad, obcordate or emarginate. Stamens 4, didynamous, the anterior pair the longer, ascending under the upper lip of the corolla; anthers 2-celled, the sacs mostly parallel. Ovary deeply 4 parted; style 2-cleft at the summit. Nutlets 3-sided, smooth. [Greek, lion's-tail.]

About 10 species, natives of Europe and Asia.

Lower leaves palmately 2–5-cleft, the upper 3-cleft. 1. *L. Cardiaca.*
Leaves deeply 3-parted, the segments cleft and incised. 2. *L. Sibiricus.*
Leaves coarsely dentate or incised-dentate. 3. *L. Marrubiastrum.*

1. Leonurus Cardìaca L. Motherwort. (Fig. 3108.)

Leonurus Cardiaca L. Sp. Pl. 584. 1753.

Perennial, puberulent; stem rather stout, strict, commonly branched, 2°–5° tall, the branches straight and ascending. Leaves membranous, slender-petioled, the lower nearly orbicular, palmately 3–5-cleft, 2′–4′ broad, the lobes acuminate, incised or dentate; upper (floral) leaves narrower, oblong-lanceolate or rhombic, 3-cleft, or the uppermost merely 3-toothed; flower-clusters numerous, exceeded by the petioles; calyx-teeth lanceolate, subulate, somewhat spreading, nearly as long as the tube; corolla pink, purple or white, 3″–5″ long, its tube with an oblique ring of hairs within, its upper lip slightly concave, densely white-woolly without, the lower lip mottled; anther-sacs parallel.

In waste places, especially about dwellings, Nova Scotia to North Carolina, Minnesota and Nebraska. Naturalized from Europe. Native also of Asia. Also called Cowthwort. June–Sept.

2. Leonurus Sibíricus L. Siberian Motherwort or Lion's-tail. (Fig. 3109.)

Leonurus Sibiricus L. Sp. Pl. 584. 1753.

Biennial, puberulent or glabrate; stem stout, branched, 2°–6° high, the branches slender. Leaves long-petioled, deeply 3-parted into ovate or lanceolate, more or less cuneate, acute or acuminate deeply cleft and incised segments, the lobes lanceolate or linear, acute; lower leaves sometimes 6′ wide, the uppermost linear or lanceolate, slightly toothed or entire; clusters numerous, dense, usually all axillary; calyx campanulate, 3″ long, glabrous or minutely puberulent, its bristle-shaped teeth slightly spreading, shorter than the tube; corolla purple or red, densely puberulent without, 4″–6″ long, its tube naked within, the upper lip arched; anther-sacs divergent.

In waste and cultivated soil, southern Pennsylvania and Delaware. Naturalized from eastern Asia. Widely distributed in tropical America as a weed. May–Sept.

3. Leonurus Marrubiástrum L. Hoarhound Motherwort or Lion's-tail. (Fig. 3110.)

Leonurus Marrubiastrum L. Sp. Pl. 584. 1753.

Biennial, puberulent or pubescent; stem stout, branched, 2°–5° high. Leaves petioled, ovate or ovate-oblong, acute or obtuse at the apex, narrowed at the base, coarsely crenate or incised-dentate, 1′–3′ long, ½′–1½′ wide, the upper narrower; flower-clusters dense, numerous, axillary; calyx finely puberulent or glabrate, its bristle-shaped somewhat spreading teeth mostly shorter than the tube; corolla nearly white, glabrate, about 4″ long, its tube scarcely exceeding the calyx, naked within, its lower lip ascending.

In waste places, New Jersey (according to S. Watson), southern Pennsylvania and Delaware. Naturalized from Europe. Native also of Asia. June–Sept.

18. LÀMIUM L. Sp. Pl. 579. 1753.

Annual or perennial mostly diffuse herbs, with crenate dentate or incised, usually cordate leaves, and rather small flowers, verticillate in axillary and terminal clusters. Calyx tubular-campanulate, about 5-nerved, 5-toothed, the teeth equal or the upper ones longer. Tube of the corolla mostly longer than the calyx, its limb 2-lipped; upper lip concave, erect, usually entire, narrowed at the base; lower lip spreading, 3-cleft, the middle lobe emarginate, contracted at the base, the lateral ones sometimes each with a tooth-like appendage. Stamens 4, didynamous, ascending under the upper lip of the corolla, the anterior pair the longer; anthers 2-celled, the sacs divaricate, often hirsute on the back. Ovary deeply 4-parted; style 2-cleft at the summit. Nutlets smooth or tuberculate. [Greek, throat, from the ringent corolla.]

About 40 species, natives of the Old World, known as Dead-Nettle or Hedge Dead-Nettle.

Upper leaves sessile or clasping. 1. *L. amplexicaule.*
Leaves all petioled.
Flowers red or purple.
Corolla 6″–9″ long; leaves not blotched. 2. *L. purpureum.*
Corolla 10″–12″ long; leaves commonly blotched. 3. *L. maculatum.*
Flowers white. 4. *L. album.*

1. Lamium amplexicaùle L. Henbit. Greater Henbit. Henbit Dead-Nettle. (Fig. 3111.)

Lamium amplexicaule L. Sp. Pl. 579. 1753.

Biennial or annual, sparingly pubescent; stems slender, weak, branched from the base or also from the lower axils, slender, ascending or decumbent, 6′–18′ long. Leaves orbicular or nearly so, coarsely crenate, ½′–1½′ wide, rounded at the apex, the lower slender-petioled, mostly cordate at the base, the upper sessile and more or less clasping; flowers rather few in axillary and terminal clusters; calyx pubescent, its teeth erect, nearly as long as the tube; corolla purplish or red, 6″–8″ long, its tube very slender, the lateral lobes of its lower lip very small, the middle one spotted; upper lip somewhat pubescent.

In waste and cultivated ground, New Brunswick to Ontario and Minnesota, south to Florida and Arkansas. Naturalized from Europe. Native also of Asia. Feb.–Oct.

2. Lamium purpùreum L. Red Dead Nettle. (Fig. 3112.)

Lamium purpureum L. Sp. Pl. 579. 1753.

Annual, slightly pubescent, branched from the base and sometimes also above; stems stout or slender, decumbent, 6′–18′ long. Leaves crenate or crenulate, the lower orbicular or broadly ovate, slender-petioled, rounded at the apex, cordate at the base, the upper ovate, short-petioled, sometimes acute at the apex, ½′–1¼′ long; flowers in axillary and terminal clusters; calyx teeth narrowly lanceolate, acuminate, slightly longer than the tube, spreading, at least in fruit; corolla purple-red, rarely exceeding ½′ long, its tube rather stout, the lateral lobes of its lower lip reduced to 1 or 2 short teeth, its middle lobe spotted; upper lip very pubescent.

In waste and cultivated soil, Rhode Island to Pennsylvania. Also in ballast about the northern seaports. Naturalized or adventive from Europe. Native also of Asia. Old names, Red or Sweet Archangel, Day-, Dog-, French-, or Deaf-nettle, Rabbit-meat. April–Oct.

3. Lamium maculàtum L. Spotted Dead Nettle. Variegated Dead Nettle. (Fig. 3113.)

Lamium maculatum L. Sp. Pl. Ed. 2, 809. 1763.

Perennial, somewhat pubescent; stems mostly slender, commonly branched, decumbent or ascending, 8′–1½° long. Leaves crenate or incised-crenate, all petioled, usually longitudinally blotched along the midrib, broadly ovate or triangular-ovate, acute or obtuse, truncate or cordate at the base, 1′–2′ long, or some of the lower ones much smaller and nearly orbicular; clusters few-flowered, mainly axillary; calyx-teeth lanceolate-subulate, as long as or longer than the tube, spreading; corolla 10″–12″ long, purple-red, its tube short, contracted near the base, with a transverse ring of hairs within, the lateral lobes of its lower lip very small.

Along roadsides, escaped from gardens, Maine to Virginia. Native of Europe and Asia. May–Oct.

4. Lamium álbum L. White Dead Nettle. (Fig. 3114.)

Lamium album L. Sp. Pl. 579. 1753.

Perennial, pubescent; stems decumbent or ascending, rather stout, simple or branched, 1°–1½° long. Leaves ovate, crenate, dentate or incised, all petioled, acute or acuminate at the apex, cordate or truncate at the base, 1′–3′ long, or the lower shorter and obtuse; clusters mostly axillary; calyx-teeth very slender, subulate, spreading, usually longer than the tube; corolla white, about 1′ long, its tube short, stout, contracted near the base, with an oblique ring of hairs within, the lateral lobes of its lower lip each with a slender tooth.

In waste places, Ontario to Virginia. Also in ballast about the northern seaports. Naturalized or adventive from Europe. Old names, White Archangel, Day-, Blind-, Dumb-, or Bee-nettle, Snake-flower, Suck-bottle. April–Oct.

19. BALLÒTA L. Sp. Pl. 582. 1753.

Perennial pubescent or tomentose herbs, some species shrubby, with dentate or crenate leaves, and small bracted flowers in axillary clusters. Calyx tubular-funnelform, 10-nerved, 5–10-toothed, the teeth dilated at the base, or sometimes connate into a spreading limb. Corolla-tube about as long as the calyx, provided with a ring of hairs within, the limb strongly 2-lipped; upper lip erect, concave, emarginate, lower lip spreading, 3-lobed, the middle lobe emarginate or obcordate. Stamens 4, didynamous, ascending under the upper lip of the corolla, the anterior pair the longer; anther-sacs divergent at maturity. Ovary deeply 4-lobed; style 2-cleft at the summit. Nutlets ovoid, smooth. [The Greek name.]

About 30 species, natives of the Old World, most numerous in the Mediterranean region.

1. Ballota nìgra L. Black or Fetid Hoarhound. (Fig. 3115.)

Ballota nigra L. Sp. Pl. 582. 1753.

Herbaceous, puberulent or pubescent, ill-scented; stem usually branched, erect, 1½°–3° high, its hairs mostly reflexed. Leaves slender-petioled, ovate, or the lower nearly orbicular, acute or obtuse at the apex, coarsely dentate, thin, narrowed, truncate or subcordate at the base, 1′–2′ long; clusters numerous, several-flowered, dense; bractlets subulate, somewhat shorter than the calyx; calyx about 4″ long, its teeth lanceolate, sharp bristle-pointed, spreading in fruit; corolla 6″–9″ long, reddish-purple to whitish, its upper lip pubescent on both sides; nutlets shining.

In waste places, eastern Massachusetts to Pennsylvania. Naturalized from Europe. June–Sept. Old names, Black Archangel, Hairhound, Henbit.

20. STÀCHYS L. Sp. Pl. 580. 1753.

Annual or perennial glabrous pubescent or hirsute herbs, with small or rather large purple yellow red or white flowers, loosely verticillate-clustered in terminal dense or interrupted spikes, or also in the upper axils. Calyx mostly campanulate, 5–10-nerved, 5-toothed, the teeth nearly equal in our species. Corolla purple in our species, its tube narrow, not exceeding the calyx, the limb strongly 2-lipped; upper lip erect, concave, entire or emarginate; lower lip spreading, 3-cleft, the middle lobe broader than the lateral ones, sometimes 2-lobed. Stamens 4, didynamous, ascending under the upper lip of the corolla, the anterior pair the longer, sometimes deflexed or twisted after anthesis; anthers contiguous in pairs, 2-celled, the sacs mostly divergent. Ovary deeply 4-lobed; style 2-cleft at the summit into subulate lobes. Nutlets ovoid or oblong. [Greek, a spike, from the spicate inflorescence.]

About 150 species, of wide geographic distribution in the north temperate zone, a few in South America and South Africa. Besides the following, some 12 others occur in the southern and southwestern United States.

Leaves narrowed at the base, linear to lanceolate.
- Stem glabrous; leaves entire, or nearly so. — 1. *S. hyssopifolia.*
- Stem retrorsely hirsute; leaves serrulate. — 2. *S. ambigua.*

Leaves cordate or truncate at the base, lanceolate to ovate.
- Stem glabrous or very nearly so. — 3. *S. tenuifolia.*
- Stem hirsute.
  - Leaves all very short-petioled, lanceolate. — 4. *S. palustris.*
  - Leaves, at least the lower, slender-petioled.
    - Leaves lanceolate or ovate, acute or acuminate.
      - Plant dark green; leaves firm; petioles 3″–18″ long. — 5. *S. aspera.*
      - Plant light green; leaves membranous; petioles ½′–2′ long. — 6. *S. cordata.*
    - Leaves ovate, obtuse; diffuse annual. — 7. *S. arvensis.*

1. Stachys hyssopifòlia Michx. Hyssop Hedge Nettle. (Fig. 3116.)

S. palustris Walt. Fl. Car. 162. 1788. Not L. 1753.
S. hyssopifolia Michx. Fl. Bor. Am. 2: 4. 1803.

Perennial, glabrous or very nearly so throughout, sometimes slightly hirsute at the nodes; stem slender, usually branched, erect or diffuse, 1°–1½° long. Leaves thin, linear or linear-oblong, acute at both ends, or the uppermost rounded at the base, short-petioled or sessile, entire, or sparingly denticulate with low teeth, 1′–2′ long, 1½″–4″ wide, the uppermost reduced to short floral bracts; clusters few–several-flowered, forming an interrupted spike; calyx glabrous or slightly hirsute, 2″–3″ long, its teeth lanceolate-subulate, nearly as long as the tube; corolla about 7″ long, light purple, glabrous.

In moist fields and thickets, Massachusetts to Florida, west to Michigan and Virginia. July–Sept.

2. Stachys ambígua (A. Gray) Britton. Dense-flowered Hedge Nettle. (Fig. 3117.)

Stachys hyssopifolia var. *ambigua* A. Gray, Syn. Fl. 2: Part 1, 387. 1878.
S. ambigua Britton, Mem. Torr. Club, 5: 285. 1894.

Perennial; stem slender, erect, retrorsely hispid, at least below, simple or sparingly branched, 1°–2° high. Leaves oblong, oblong-lanceolate, or linear, pubescent or glabrate, acuminate or acute at the apex, narrowed at the base, 2″–10″ wide, 1′–3′ long, serrulate; clusters in a terminal rather dense spike, and usually also in the upper axils; calyx more or less hirsute, 2½″ long, its lanceolate-subulate teeth more than one-half as long as the tube; corolla as in the preceding.

In moist soil, eastern Pennsylvania to Georgia, west to Illinois and Kentucky. July–Aug.

3. Stachys tenuifòlia Willd. Smooth Hedge Nettle. (Fig. 3118.)

Stachys tenuifolia Willd. Sp. Pl. 3: 100. 1801.
S. glabra Ridd. Suppl. Cat. Ohio Pl. 16. 1836.
S. Cincinnatensis Kuntze, Rev. Gen. Pl. 531. 1891?

Perennial; stem quite smooth, or slightly scabrous on the angles, slender, erect or ascending, usually branched, 1°–2½° high. Leaves lanceolate, oblong, or ovate-lanceolate, slender-petioled, thin, acuminate at the apex, obtuse or subcordate at the base, sharply dentate or denticulate, dark green, 2′–5′ long, ½′–2′ wide; clusters several or numerous in terminal spikes, or also in the upper axils; calyx glabrous, or sparingly hirsute, 2″ long, its teeth triangular-ovate to lanceolate, acute, one-half as long as the tube or more; corolla about 6″–8″ long, pale red and purple.

In moist fields and thickets, New York to Illinois, North Carolina and Louisiana. Ascends to 4000 ft. in North Carolina. June–Aug.

4. Stachys palústris L. Hedge Nettle. Marsh or Clown's Woundwort. (Fig. 3119.)

Stachys palustris L. Sp. Pl. 580. 1753.

Perennial, hirsute or pubescent all over; stem erect, strict, simple or somewhat branched, commonly slender, and retrorse-hispid on the angles, 1°–4° high. Leaves firm, lanceolate, oblong, or oblong-lanceolate, sessile, or very short-petioled, acuminate or acute at the apex, truncate, cordate or subcordate at the base, 2′–5′ long, ½′–1′ wide, crenulate or dentate; flower-clusters forming an elongated interrupted spike, sometimes also in the upper axils; flowers 6–10 in a whorl; calyx pubescent, its subulate teeth more than one-half as long as the tube; corolla purplish to pale red, purple spotted, 6″–8″ long, its upper lip pubescent.

In moist soil, Newfoundland to the Northwest Territory and Oregon, south to southern New York, Illinois, Michigan, and in the Rocky Mountains to New Mexico. Also in Europe and Asia. June–Sept. Old names, Clown's Heal or All-heal, Cock-head, Dead Nettle, Rough Weed. June–Sept.

5. Stachys áspera Michx. Rough Hedge Nettle or Woundwort. (Fig. 3120.)

Stachys aspera Michx. Fl. Bor. Am. 2: 5. 1803.
Stachys hispida Pursh, Fl. Am. Sept. 407. 1814.
S. palustris var. *aspera* A. Gray, Man. Ed. 2, 317. 1856.

Perennial, rough hairy; stem erect or ascending, simple or branched, 2°–4° high, commonly retrorse-hispid on the angles. Leaves firm, oblong, oblong-lanceolate, or ovate-oblong, crenate-dentate, acute or acuminate at the apex, truncate, rounded or cordate at the base, 2′–6′ long, ½′–2½′ wide, the lower slender-petioled, the upper short-petioled; spike terminal, mostly interrupted; clusters sometimes also in the upper axils; calyx about 3″ long, hirsute or glabrate, its teeth triangular-lanceolate, acuminate, about one-half as long as the tube; corolla red-purple, about ½′ long, its upper lip pubescent.

In moist soil, Ontario to Florida, Minnesota and Louisiana. Ascends to 5300 ft. in Virginia. June–Sept.

6. Stachys cordàta Riddell. Light-green Hedge Nettle. (Fig. 3121.)

Stachys cordata Riddell, Suppl. Cat. Ohio Pl. 15. 1836.
Stachys Nuttallii Shuttw.; Benth. in DC. Prodr. 12: 469. 1848.
Stachys palustris var. *cordata* A. Gray, Man. Ed. 2, 317. 1856.

Perennial, hirsute, pale green; stem slender, weak, mostly simple, ascending or reclining, 2°–3° long. Leaves membranous, flaccid, ovate, oblong or ovate-lanceolate, acuminate, acute or the lowest obtuse at the apex, nearly all of them cordate at the base, dentate or crenate all around, long-petioled, 3′–6′ long, 1′–3′ wide, the lowest petioles nearly as long as the blades; spike interrupted; calyx-teeth subulate-lanceolate, about half the length of the tube; corolla purplish, pubescent or puberulent, about 5″ long.

In woods and thickets, Ohio to North Carolina and Tennessee. Ascends to 2100 ft. in Virginia. July–Aug.

7. Stachys arvénsis L. Corn or Field Woundwort. (Fig. 3122.)

Stachys arvensis L. Sp. Pl. Ed. 2, 814. 1763.

Annual, hirsute; stem very slender, diffusely branched, decumbent or ascending, 3′–2° long. Leaves ovate or ovate-oblong, thin, long-petioled, obtuse at the apex, crenate all around, cordate or the upper rounded at the base, about 1′ long; lower petioles commonly as long as the blades; clusters 4–6-flowered, borne in the upper axils and in short terminal spikes; calyx about 3″ long, its teeth lanceolate, acuminate, nearly as long as the tube; corolla purplish, 3″–5″ long.

In waste places, Maine, Massachusetts, and in ballast about the eastern seaports. Naturalized from Europe. July–Oct.

21. BETÓNICA L. Sp. Pl. 582. 1753.

Annual or perennial herbs, similar to *Stachys*. Lower leaves very long-petioled. Verticils many-flowered, in terminal spikes. Calyx nearly equally 5-toothed, 5–10-nerved. Corolla purple, the tube exceeding the calyx, the limb strongly 2-lipped; upper lip concave;

lower 3-cleft, spreading. Stamens and pistil as in *Stachys*, but the anther-sacs parallel in some species. Nutlets ovoid, rounded above. [The classical Latin name of Wood Betony.]

Ten species, or more, natives of Europe and Asia.

1. Betonica officinàlis L. Betony. Wood Betony. (Fig. 3123.)

Betonica officinalis L. Sp. Pl. 573. 1753.
Stachys Betonica Benth. Lab. Gen. & Sp. 532. 1834.

Perennial, pilose or glabrate, deep green; stem slender, erect, usually simple, 1°–3° tall. Leaves oblong or ovate, obtuse at the apex, crenate all around, firm, cordate or truncate at the base, the basal and lower ones very long-petioled, the blades 3′–6′ long, the the upper distant, short-petioled or nearly sessile; lower petioles 1½–4 times as long as the blades; spike short, dense; bracts ovate, mucronate, about as long as the calyx; calyx-teeth acicular, half as long as the tube or more; corolla-tube exserted.

In a thicket at Newton, Mass. Fugitive from Europe. Also called Bishop's wort and Wild Hop. July–Sept.

22. SÁLVIA L. Sp. Pl. 23. 1753.

Herbs, or some species shrubs, with clustered usually showy flowers, the clusters mostly spiked, racemed, or panicled. Calyx ovoid, tubular or campanulate, mostly naked in the throat, 2-lipped; upper lip entire or 3-toothed; lower lip 2-cleft or 2-toothed. Corolla strongly 2-lipped; upper lip usually concave, sometimes arched, entire, emarginate or 2-lobed; lower lip spreading, 3-cleft or 3-lobed. Anther-bearing stamens 2 (the posterior pair wanting or rudimentary); filaments usually short; connective of the anthers transverse, linear or filiform, bearing a perfect anther-sac on its upper end, its lower end dilated, capitate or sometimes bearing a small or rudimentary one. Ovary deeply 4-parted; style 2-cleft at the summit. Nutlets smooth, usually developing mucilage and spiral tubes when wetted. [Latin, salvus, safe, from its healing virtues.]

About 500 species, of wide distribution in temperate and tropical regions. Besides the following, some 25 others occur in southern and western North America.

Leaves mostly basal, only 1–3 pairs on the stem.
- Leaves lyrate-pinnatifid or repand; upper corolla-lip short. — 1. *S. lyrata.*
- Leaves crenulate; upper lip arched, longer than the lower. — 2. *S. pratensis.*

Stem leafy, bearing several pairs of leaves.
- Leaves narrowly oblong, or lanceolate.
  - Corolla 10″–15″ long, its tube exserted. — 3. *S. Pitcheri.*
  - Corolla 4″–6″ long, its tube not exserted. — 4. *S. lanceolata.*
- Leaves ovate, or broadly oval.
  - Upper corolla-lip short, not exceeding the lower.
    - Leaves merely crenate or crenulate; fruiting calyx spreading. — 5. *S. urticifolia.*
    - Leaves pinnatifid, sinuate or incised; fruiting calyx deflexed. — 6. *S. verbenaca.*
  - Upper lip of corolla arched, longer than the lower. — 7. *S. Sclarea.*

1. Salvia lyràta L. Lyre-leaved Sage. (Fig. 3124.)

Salvia lyrata L. Sp. Pl. 23. 1753.

Perennial or biennial, hirsute or pubescent; stem slender, simple, or sparingly branched, erect, 1°–3° high, bearing 1 or 2 distant pairs of small leaves (rarely leafless), and several rather distant whorls of large violet flowers. Basal leaves tufted, long-petioled, obovate or broadly oblong, lyrate-pinnatifid or repand-dentate, thin, 3′–8′ long; stem-leaves similar, or narrower and entire, sessile, or short-petioled; clusters about 6-flowered; calyx campanulate, the teeth of its upper lip subulate, those of the lower longer, aristulate; corolla about 1′ long, the tube very narrow below, the upper lip much smaller than the lower; filaments slender; anther-sacs borne on both the upper and lower ends of the connective, the lower one often smaller.

In dry, mostly sandy woods and thickets, New Jersey to Florida, west to Illinois, Arkansas and Texas. Corolla rarely undeveloped. May–July.

2. Salvia praténsis L. Meadow Sage. (Fig. 3125.)

Salvia pratensis L. Sp. Pl. 25. 1753.

Perennial, pubescent or puberulent; stem erect, rather stout, simple or little branched, sparingly leafy. Basal leaves long-petioled, ovate, oblong, or ovate-lanceolate, irregularly crenulate, obtuse at the apex, rounded or cordate at the base, thick, rugose, 2′–7′ long; stem leaves much smaller, narrower, commonly acute, sessile or nearly so; clusters spicate, the spike elongated, interrupted; calyx campanulate, glandular-pubescent, the teeth of the upper lip minute, those of the lower long, subulate; corolla purple, minutely glandular, its upper lip strongly arched, mostly longer than the lower; lower end of the connective with a small or imperfect anther-sac.

Atlantic Co., N. J. Fugitive or adventive from Europe. May–July.

3. Salvia Pítcheri Torr. Pitcher's Sage. (Fig. 3126.)

Salvia Pitcheri Torr.; Benth. Lab. 251. 1833.
Salvia azurea var. *grandiflora* Benth. in DC. Prodr. 12: 302. 1848.

Perennial, downy; stem stout, branched or simple, erect, 2°–5° high; branches nearly erect. Leaves linear or linear-oblong, dentate to entire, sessile, or narrowed at the base into short petioles, firm, 2′–5′ long, 2″–8″ wide, the uppermost reduced to small bracts; clusters in long dense terminal spikes, or the lower ones distant; calyx obloug-campanulate, densely and finely woolly, about 3″ long, its upper lip entire, obtuse, the lower with 2 ovate acute teeth; corolla blue, finely pubescent without, 1′ long, its lower lip broad, sinuately 3-lobed, longer than the concave upper one; lower ends of the connectives dilated, often adherent to each other, destitute of anther-sacs.

On dry plains, Missouri, Kansas and Colorado to Texas. Introduced into Illinois. July–Sept.

4. Salvia lanceolàta Willd. Lance-leaved Sage. (Fig. 3127.)

Salvia lanceolata Willd. Enum. 37. 1809.

Annual, puberulent or glabrous; stem leafy, usually much branched, erect or diffuse, 6′–18′ high. Leaves oblong, linear-oblong or oblong-lanceolate, petioled, mostly obtuse at the apex and narrowed at the base, crenulate-dentate or entire, 1′–2′ long, 2″–5″ wide, the upper reduced to lanceolate-subulate, rather persistent bracts; flowers mostly opposite, but sometimes 3–4 together in the terminal spike-like racemes; pedicels shorter than the campanulate calyx; calyx 2″–3″ long, its upper lip ovate, entire, the lower 2-cleft, the teeth ovate, mucronate; corolla blue (?) about 4″ long, its lower lip narrow, twice as long as the upper; lower ends of the connectives dilated.

On plains, Nebraska and Colorado to Texas, Arizona and Mexico. May–Sept.

5. Salvia urticifòlia L. Nettle-leaved Sage. (Fig. 3128.)

Salvia urticifolia L. Sp. Pl. 24. 1753.

Perennial, pubescent, puberulent or nearly glabrous; stem glandular above, rather slender, ascending or erect, 1°–2° high. Leaves thin, ovate, 2′–4′ long, irregularly dentate or crenate-dentate, usually acute at the apex, abruptly contracted below into margined petioles; clusters several-flowered, in terminal interrupted spikes; bracts early deciduous; calyx oblong-campanulate, about 3″ long, the upper lip minutely 3-toothed, the lower 2-cleft, its teeth triangular-lanceolate, acuminate, spreading in fruit; corolla puberulent without, 6″–8″ long, blue and white, the lower lip broad, 3-lobed, twice as long as the upper; lower ends of the connectives dilated.

In woods and thickets, Maryland to Kentucky, south to Georgia and Louisiana. April-June.

6. Salvia verbenàca L. Wild Sage. Wild Clary. (Fig. 3129.)

Salvia verbenaca L. Sp. Pl. 25. 1753.

Perennial; stem glandular-pubescent, erect, simple or sparingly branched, 1°–2° high. Leaves ovate, ovate-lanceolate or oblong, coarsely and irregularly incised-dentate or pinnatifid, petioled, or the uppermost sessile, the lower 3′–8′ long, obtuse at the apex, cordate at the base, nearly glabrous, the upper acute, much smaller; floral bracts broadly ovate, short; clusters several-flowered in elongated terminal interrupted spikes; pedicels shorter than the calyx; calyx deflexed in fruit, 3″–4″ long, its upper lip recurved-spreading, with 3 minute connivent teeth, the lower one with 2 lanceolate acuminate mucronate teeth; corolla blue, about 4″ long, its upper lip nearly straight, scarcely longer than the lower; lower ends of the connectives dilated and adnate to each other.

In waste places, Ohio to South Carolina. Naturalized from Europe. Native also of Asia. June-Aug.

7. Salvia Sclàrea L. Clary. Clear-eye. See-bright. (Fig. 3130.)

Salvia Sclarea L. Sp. Pl. 27. 1753.

Biennial or annual, glandular-pubescent; stem stout, erect, 2°–3½° high. Leaves broadly ovate, rugose, acute or obtuse at the apex, cordate at the base, irregularly dentate-crenate or denticulate, the lower long-petioled, 6′–8′ long, the upper small, short-petioled or sessile; clusters several-flowered, numerous in terminal spikes; bracts broad, ovate, acuminate, commonly longer than the calyx, pink or white; calyx campanulate, deflexed-spreading in fruit, 4″–5″ long, its lips about equal, the teeth all subulate-acicular; corolla blue and white, about 1′ long; upper lip arched, laterally compressed, longer than the lower one; lower portions of the connectives dilated.

In fields, Pennsylvania, escaped from gardens, Naturalized from Europe. The mucilage of the seeds used to clear specks from the eye. June-Aug.

23. MONÀRDA L. Sp. Pl. 22. 1753.

Perennial or annual erect aromatic herbs, with dentate or serrate leaves, and rather large white red purple yellowish or mottled flowers, in dense capitate clusters, mostly bracteate and bracteolate, terminal and sometimes also axillary, the bracts sometimes brightly colored. Calyx tubular, narrow, 15-nerved, nearly or quite equally 5-toothed, mostly villous in the throat. Corolla glabrous within, usually puberulent or glandular without, the tube slightly dilated above, the limb 2-lipped; upper lip erect or arched, emarginate or entire; lower lip spreading, 3-lobed, the middle lobe larger or longer than the others. Anther-bearing stamens 2, ascending, usually exserted, the posterior pair (staminodia) rudimentary or wanting; anthers linear, versatile, 2-celled, the sacs divaricate, more or less confluent at the base. Ovary deeply 4-parted; style 2-cleft at the apex; nutlets ovoid, smooth. [In honor of Nicolas Monardes, a Spanish physician and botanist of the sixteenth century.]

About 10 species, natives of North America and Mexico.

Flower-clusters solitary, terminal (rarely also in the uppermost axils).
- Leaves manifestly petioled, the petioles commonly slender.
  - Corolla scarlet, 1½′–2′ long; bracts red. — 1. *M. didyma.*
  - Corolla white, pink, or purple, 1′–1½′ long.
    - Leaves membranous; corolla slightly pubescent, 10″–12″ long. — 2. *M. Clinopodia.*
    - Leaves thin or firm; corolla pubescent, 1′–1½′ long.
      - Pubescence spreading; leaves thin.
        - Corolla cream-color, pink, or purplish. — 3. *M. fistulosa.*
        - Corolla or bracts deep purple or purple-red. — 4. *M. media.*
      - Pubescence short, canescent; leaves firm, pale. — 5. *M. scabra.*
- Leaves sessile, or very short-petioled. — 6. *M. Bradburiana.*

Flower-clusters both axillary and terminal.
- Calyx-teeth triangular-lanceolate; corolla yellowish, mottled. — 7. *M. punctata.*
- Calyx-teeth subulate-aristate; corolla white or purple, not mottled. — 8. *M. citriodora.*

1. Monarda dídyma L. Oswego Tea. American Bee Balm. (Fig. 3131.)

Monarda didyma L. Sp. Pl. 22. 1753.

Perennial; stem stout, simple or branched, villous-pubescent, at least at the nodes, or glabrate, 2°–3° high. Leaves thin, ovate or ovate-lanceolate, petioled, dark green, usually with some villous pubescence beneath and short scattered hairs above, acuminate at apex, rounded or narrowed at the base, sharply serrate, 3′–6′ long, 1′–3′ wide; lower petioles often 1′ long; flower-clusters almost always solitary, terminal; bracts commonly red; calyx incurved, nearly or quite glabrous without, slightly hirsute in the throat, its teeth subulate, nearly erect, about as long as the diameter of the tube; corolla scarlet, 1½′–2′ long, sparingly puberulent; stamens exserted.

In moist soil, especially along streams, New Brunswick (?) to Ontario and Michigan, south to Georgia. Ascends to 5200 ft. in North Carolina. Called also Fragrant Balm, Mountain Mint and Indian's Plume. July–Sept.

2. Monarda Clinopòdia L. Basal Balm. (Fig. 3132.)

Monarda Clinopodia L. Sp. Pl. 22. 1753.
Pycnanthemum Monardella Michx. Fl. Bor. Am. 2: 8. *pl. 34.* 1803.

Perennial; stem slender, simple, or with few long ascending branches, glabrous or slightly villous, 1°–3° high. Leaves lanceolate, ovate or ovate-lanceolate, membranous, bright green, mostly slender-petioled, more or less villous on the veins beneath and puberulent above, acuminate at the apex, rounded, narrowed or rarely subcordate at the base, sharply serrate, 2′–4′ long, ½′–2′ wide; clusters solitary, terminal; bracts pale or white; calyx curved, nearly glabrous without, somewhat hirsute in the throat, its teeth subulate, slightly spreading, about as long as the diameter of the tube; corolla yellowish-pink, slightly pubescent, 10″–12″ long; stamens exserted.

In woods and thickets, Ontario to Georgia and Kentucky. Ascends to 5000 ft. in North Carolina. June–Aug.

3. Monarda fistulòsa L. Wild Bergamot. (Fig. 3133.)

Monarda fistulosa L. Sp. Pl. 22. 1753.
Monarda mollis L. Amoen. Acad. 3: 399. 1753.
Monarda fistulosa var. *mollis* Benth. Lab. Gen. & Sp. 317. In part. 1833.

Perennial, villous-pubescent or glabrate; stem slender, usually branched, 2°–3° high. Leaves thin but not membranous, green, usually slender-petioled, lanceolate, ovate or ovate-lanceolate, acuminate at the apex, serrate, rounded, narrowed or sometimes cordate at the base, 1½′–4′ long, ½′–2½′ wide; clusters solitary and terminal, or rarely also in the uppermost axils; bracts whitish or purplish; calyx puberulent or glabrous, densely villous in the throat, its subulate teeth rarely longer than the diameter of the tube; corolla pubescent, especially on the upper lip, yellowish-pink or purplish, 1′–1½′ long; stamens exserted.

On dry hills and in thickets, Maine and Ontario to Minnesota, south to Florida and Louisiana. Ascends to 2500 ft. in Virginia. June–Sept.

4. Monarda mèdia Willd. Purple Bergamot. (Fig. 3134.)

Monarda media Willd. Enum. 32. 1809.
Monarda fistulosa var. *rubra* A. Gray, Syn. Fl. 2: Part 1, 374. 1878.
M. fistulosa var. *media* A. Gray, loc. cit. 1878.

Perennial, sparingly hairy or glabrate; stem stout, commonly branched, 2°–3½° high. Leaves thin, but not membranous, dark green, ovate or ovate-lanceolate, or the uppermost lanceolate, slender-petioled, acuminate at the apex, sharply toothed, usually rounded at the base, 3′–5′ long, 1′–3′ wide; flower-clusters terminal, solitary, large; bracts deep purple, very conspicuous; calyx curved, glabrous, or very nearly so, slightly villous in the throat, teeth slightly spreading; corolla purple or purple-red, about 1½′ long, its upper lip pubescent; stamens exserted.

In moist thickets, Maine to Pennsylvania and Virginia, along the mountains. June–Aug.

5. Monarda scàbra Beck. Pale Wild Bergamot. (Fig. 3135.)

Monarda scabra Beck, Am. Journ. Sci. 10: 260. 1826.
Monarda fistulosa var. *mollis* Benth. Lab. Gen. & Sp. 317. In part. 1883.

Perennial; stem slender, puberulent at least above, usually branched, 1°–2½° high. Leaves thick or firm, pale, usually short-petioled, acuminate or acute at the apex, rounded, narrowed or cordate at the base, sharply or sparingly serrate, canescent or puberulent, rarely nearly glabrous, sometimes with a few scattered spreading hairs on the veins or petiole, 1′–3½′ long, ½′–1′ wide; flower-clusters terminal, solitary; bracts green or slightly pink, calyx puberulent, often hairy at the summit, densely villous in the throat, its short subulate teeth nearly erect; corolla yellowish or pink, about 1¼′ long, pubescent, sometimes glandular; stamens exserted.

On prairies and plains, mostly in dry soil, Northwest Territory and British Columbia to Nebraska, Missouri, Texas and Arizona. June–Aug.

6. Monarda Bradburiàna Beck. Bradbury's Monarda. (Fig. 3136.)

Monarda Bradburiana Beck, Am. Journ. Sci. 10: 260. 1826.

Perennial, sparingly villous or glabrate; stem slender, often simple, 1°–2° high. Leaves rather thin, bright green, ovate or ovate-lanceolate, sessile, or very nearly so, or partly clasping by the cordate or subcordate base, acuminate at the apex, serrate, 2′–3½′ long; flower-clusters solitary and terminal; bracts green or purplish; calyx glabrous outside, hirsute within and narrowed at the throat, its teeth long, bristle-pointed, divergent, longer than the diameter of the tube; corolla pink or nearly white, about 1′ long, its upper lip pubescent or puberulent, the lower commonly purple-spotted; stamens exserted.

On dry hills or in thickets, Illinois to Alabama, west to Missouri and Kansas. May–July.

7. Monarda punctàta L. Horse-mint. (Fig. 3137.)

Monarda punctata L. Sp. Pl. 22. 1753.

Perennial, usually rather densely pubescent or downy; stem usually much branched, 2°–3° high. Leaves lanceolate, linear-lanceolate or narrowly oblong, serrate with low teeth, or nearly entire, usually acute at both ends, green, manifestly petioled, 1′–3′ long, 2″–7″ wide, often with smaller ones fascicled in their axils; flower-clusters axillary and terminal, numerous; bracts white or purplish, conspicuous, acute; calyx puberulent, villous in the throat, its teeth short, triangular-lanceolate, acute, not longer than the diameter of the tube; corolla yellowish, purple-spotted, about 1′ long, the stamens equalling or slightly surpassing its pubescent upper lip.

In dry fields, southern New York to Florida, west to Wisconsin and Texas. July–Oct.

8. Monarda citriodòra Cerv. Lemon Monarda. (Fig. 3138.)

M. citriodora Cerv.; Lag. Nov. Gen. & Sp. 2. 1816.
Monarda aristata Nutt. Trans. Am. Phil. Soc. (II.) 5: 186. 1833–37.

Annual, puberulent; stem stout, simple or branched, 1°–2° high. Leaves lanceolate or oblong-lanceolate, mostly sharply serrate or serrulate, acute at the apex, narrowed at the base, 1′–3′ long, 2″–6″ wide; flower-clusters axillary and terminal, several or numerous; bracts white or purple, conspicuous, awned at the tip, the awns becoming recurved; calyx-tube nearly glabrous, the throat densely villous, the teeth bristle-pointed, barbed, divergent or spreading, nearly half as long as the tube; corolla pink or nearly white, not spotted, nearly or quite glabrous, 10″–12″ long; stamens not exserted.

On dry plains, Nebraska and Colorado to Missouri, Texas and Arizona. Naturalized in Tennessee (according to Gray). June–Sept.

Monarda clinopodioides A. Gray, a related Texan species, with a slender stem, green or greenish bracts, and hirsute calyx with erect broader teeth, may occur in southern Kansas.

24. BLEPHÍLIA Raf. Journ. Phys. 89: 98. 1819.

Perennial hirsute or pubescent erect herbs, with axillary and terminal dense glomerules of rather small purplish or bluish flowers, or the glomerules in terminal more or less interrupted spikes. Calyx tubular, 13-nerved, not villous in the throat, 2-lipped, the upper lip 3-toothed, the lower 2-toothed, the teeth all aristate or those of the lower lip subulate. Corolla glabrous within, the tube expanded above, the limb 2-lipped; upper lip erect, entire; lower lip 3-lobed, the middle lobe narrower than the lateral ones. Anther-bearing (anterior) stamens 2, ascending, exserted or included; posterior stamens reduced to filiform staminodia, or none; anthers 2-celled, the sacs divaricate, somewhat confluent at the base. Ovary deeply 4-parted; style 2-cleft at the apex. Nutlets ovoid, smooth. [Greek, eyelash, from the fringed calyx-teeth.]

Two species, natives of eastern North America.

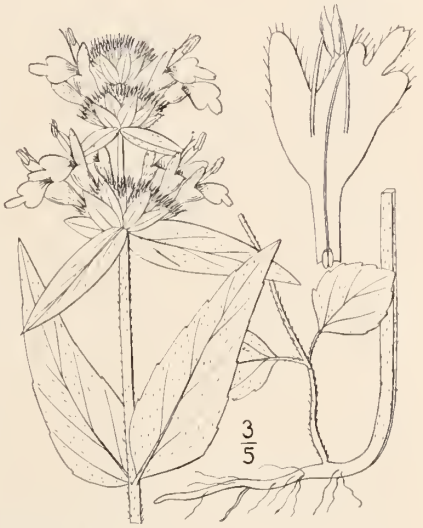
Pubescence short; upper leaves lanceolate or oblong, slightly serrate. 1. *B. ciliata.*
Pubescence villous; leaves ovate or ovate-lanceolate, sharply serrate. 2. *B. hirsuta.*

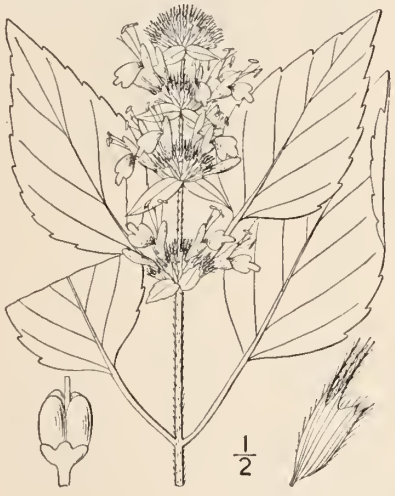
1. Blephilia ciliàta (L.) Raf. Downy Blephilia. (Fig. 3139.)

Monarda ciliata L. Sp. Pl. 23. 1753.
Blephilia ciliata Raf. Journ. Phys. 89: 98. 1819.

Stem puberulent, or with some short-villous pubescence above, commonly simple, 1°–2° high. Lower leaves and those of sterile shoots ovate or oval, slender-petioled, crenate-denticulate, 1′–2′ long, the upper lanceolate or oblong-lanceolate, short-petioled or sessile, mostly acute, longer and narrower, nearly entire; flower-clusters in a terminal spike and in the uppermost axils; outer bracts ovate to lanceolate, acuminate, usually purplish, pinnately veined, ciliate; calyx hirsute, the teeth of the upper lip about one-third longer than those of the lower; corolla purple, villous-pubescent, 5″–6″ long; stamens exserted or included.

In dry woods and thickets, Massachusetts to Michigan and Wisconsin, south to Georgia and Missouri. June–Aug.





2. Blephilia hirsùta (Pursh) Torr. Hairy Blephilia. (Fig. 3140.)

Monarda hirsuta Pursh, Fl. Am. Sept. 19. 1814.
Blephilia nepetoides Raf. Journ. Phys. 89: 98. 1819.
Blephilia hirsuta Torr. Fl. U. S. 27. 1824.

Stem villous-pubescent, usually branched, 1½°–3° high. Leaves membranous, ovate or ovate-lanceolate, acuminate at the apex, rounded or narrowed at the base, sharply serrate, slender-petioled, 2′–4′ long, or the lower shorter and broader; flower-clusters axillary, or in a short terminal spike; outer bracts lanceolate or linear-lanceolate, long-acuminate, hirsute; calyx-tube nearly glabrous, its teeth very villous, those of the upper lip much exceeding the lower; corolla pubescent, pale purple, rather conspicuously darker-spotted, 4″–5″ long.

In woods and thickets, Vermont to Wisconsin, south to Georgia and Texas. Ascends to 4000 ft. in North Carolina. June–Sept.

25. HEDEÒMA Pers. Syn. 2: 131. 1807.

Annual or perennial, strongly aromatic and pungent herbs, with small entire or crenulate leaves, and small blue or purple flowers in axillary clusters, these crowded into terminal spikes or racemes. Calyx tubular, 13-nerved, villous in the throat, the mouth mostly contracted in fruit, gibbous on the lower side at the base, or nearly terete, 2-lipped, or nearly equally 5-toothed, the upper lip 3-toothed, the lower 2-cleft. Corolla-limb 2-lipped, the upper lip erect, entire, emarginate or 2-lobed, the lower spreading, 3-cleft. Perfect stamens 2, ascending under the upper lip, their anthers 2-celled, the sacs divergent or divaricate. Sterile stamens (staminodia) 2, minute, or none, very rarely anther-bearing. Ovary deeply 4-parted; style 2-cleft at the summit, glabrous. Nutlets ovoid, smooth. [Greek, sweet smell.]

About 15 species, natives of America. Besides the following, some 8 others occur in the southern and southwestern States. Sometimes called Mock Pennyroyal.

Teeth of the upper lip of the calyx triangular; leaves serrate. 1. *H. pulegioides.*
Teeth of both lips of the calyx subulate; leaves entire.
Calyx-teeth all nearly equal; annual. 2. *H. hispida.*
Teeth of the lower lip nearly twice as long as the upper; perennial. 3. *H. Drummondii.*

1. Hedeoma pulegioides (L.) Pers. American Pennyroyal. (Fig. 3141.)

Melissa pulegioides L. Sp. Pl. 593. 1753.
Cunila pulegioides L. Sp. Pl. Ed. 2, 30. 1762.
Hedeoma pulegioides Pers. Syn. 2: 131. 1807.

Annual; stem very slender, erect, much branched, finely soft-pubescent, 6′–18′ high, the branches ascending. Leaves ovate to obovate-oblong, petioled, sparingly serrate, mostly obtuse at the apex and narrowed at the base, glabrous, or sparingly pubescent, thin, ½′–1½′ long, 2″–8″ wide, the upper smaller; clusters few-flowered, axillary, rather loose; pedicels pubescent, shorter than or equalling the calyx; calyx pubescent, gibbous, oblong-ovoid in fruit, its 3 upper teeth triangular, acute, not exceeding the 2 subulate hispid lower ones; corolla purple, about 3″ long; rudimentary stamens manifest, capitate at the summit, or rarely anther-bearing.

In dry fields, Cape Breton Island to Ontario and Minnesota, south to Florida and Nebraska. Also called Tick-weed and Squaw-mint. July–Sept.

2. Hedeoma hispida Pursh. Rough Pennyroyal. (Fig. 3142.)

Hedeoma hispida Pursh, Fl. Am. Sept. 414. 1814.
Hedeoma hirta Nutt. Gen. 1: 16. 1818.

Annual; stem erect, branched, slender, 3′–8′ high, pubescent, the branches erect-ascending, very leafy and copiously flowered. Leaves linear, entire, firm, sessile, or the lower short-petioled, blunt or subacute at the apex, narrowed at the base, more or less hispid-ciliate but otherwise mostly glabrous, ½′–1′ long, about 1″ wide, the lower much shorter and smaller; clusters axillary, numerous, crowded, several-flowered; pedicels pubescent, shorter than the calyx; bracts subulate, very hispid, about equalling the calyx; calyx oblong, gibbous, hispid, its teeth all subulate, nearly equal in length, upwardly curved in fruit, about one-half as long as the tube, the 2 lower ones somewhat narrower and more hispid than the upper; corolla about 3″ long, bluish-purple; sterile stamens rudimentary or none.

On dry plains, Illinois to the Northwest Territory, Louisiana, Arkansas and Colorado. May–Aug.

3. Hedeoma Drummóndii Benth. Drummond's Pennyroyal. (Fig. 3143.)

H. Drummondii Benth. Lab. Gen. & Sp. 368. 1834.
H. ciliata Nutt. Journ. Acad. Phila. (II.) 1: 183. 1847.

Perennial from a woody base, with an ashy down nearly all over; stems much branched, slender, erect, 6′–18′ high, the branches ascending. Leaves oblong or linear, entire short-petioled or sessile, obtuse at the apex, narrowed at the base, 5″–10″ long, 1″–2½″ wide, the lowest shorter; clusters axillary, loosely few-flowered; pedicels puberulent, about one-half as long as the calyx and equalling or longer than the subulate bracts; calyx cylindric-oblong, hirsute, slightly gibbous, its teeth all subulate, upwardly curved and connivent in fruit, the 2 lower nearly twice as long as the 3 upper; corolla purple, 4″–6″ long; sterile stamens rudimentary or none.

In dry soil, Nebraska and Colorado to Texas, Arizona and northern Mexico. April–Aug.

26. MELÍSSA L. Sp. Pl. 592. 1753.

Leafy branching herbs, with broad dentate leaves, and rather small white or yellowish axillary clustered somewhat secund flowers. Calyx oblong-campanulate, deflexed in fruit, 13-nerved, nearly naked in the throat, 2-lipped; upper lip flat, 3-toothed, the lower 2-parted. Corolla exserted, its tube curved-ascending, enlarged above, naked within, the limb 2-lipped; upper lip erect, emarginate; lower lip 3-cleft, spreading. Stamens 4, didynamous, connivent and ascending under the upper lip of the corolla; anthers 2-celled, their sacs divaricate. Ovary deeply 4-parted; style 2-cleft at the summit, the lobes subulate. Nutlets ovoid, smooth. [Greek, bee.]

About 4 species, natives of Europe and western Asia.

1. Melissa officinàlis L. Garden or Lemon Balm. Bee-balm. (Fig. 3144.)

Melissa officinalis L. Sp. Pl. 592. 1753.

Perennial, pubescent; stem rather stout, erect or ascending, 1°–2½° high. Leaves ovate, petioled, mostly obtuse at both ends, sometimes cordate, pinnately veined, coarsely dentate or crenate-dentate, 1′–2½′ long. Flowers several in the axillary clusters; pedicel shorter than the calyx; calyx about 3″ long, the teeth of its lower lip slightly exceeding those of the upper; corolla white, 5″–7″ long.

In waste places, thickets and woods, Maine to Georgia and West Virginia. Naturalized from Europe. Plant lemon-scented. Called also Balm-leaf, Honey-plant, Pimentary, Balm-mint. June–Aug.

27. SATUREÌA L. Sp. Pl. 567. 1753.

Herbs or shrubs, with small entire leaves, sometimes with smaller ones fascicled in their axils, and bracted purple flowers in dense terminal or axillary clusters. Calyx campanulate, mostly 10-nerved, 5-toothed, naked or rarely villous in the throat. Corolla-limb 2-lipped, the upper lip erect, flat, entire or emarginate, the lower spreading, 3-cleft. Stamens 4, connivent under the upper lip of the corolla; anthers 2-celled, the sacs parallel or divaricate. Ovary deeply 4-parted; style 2-cleft at the summit. Nutlets oblong or oval. [The classical Latin name of the plant.]

About 18 species, the following introduced as a garden herb from Europe, one of doubtful affinity in Florida, the others of the Mediterranean region.

1. Satureia horténsis L. Savory. Summer Savory. (Fig. 3145.)

Satureia hortensis L. Sp. Pl. 568. 1753.

Annual, puberulent; stems erect, slender, much branched, 6′–18′ high. Leaves linear or linear-oblong, short-petioled, entire, acute at both ends, ½′–1½′ long, 1″–2″ wide; clusters 3″–5″ in diameter, terminal and in many of the upper axils; bracts linear, small, minute, or wanting; calyx about equalling the corolla-tube, somewhat pubescent, its teeth subulate, about as long as the tube, ciliate; corolla little longer than the calyx; stamens scarcely exserted.

In waste places, New Brunswick and Ontario to Pennsylvania, west to Nevada. Naturalized or adventive from Europe. July–Sept.

28. CLINOPÒDIUM L. Sp. Pl. 587. 1753.

[CALAMINTHA Moench, Meth. 408. 1794.]

Herbs, or low shrubs, with entire or sparingly dentate leaves, and rather large flowers variously clustered. Calyx tubular or oblong, mostly gibbous at the base, about 13-nerved,

2-lipped, naked or villous in the throat, the upper lip 3-toothed, the lower 2-cleft. Corolla usually expanded at the throat, the tube straight, mostly longer than the calyx, the limb 2-lipped; upper lip erect, entire or emarginate; lower lip spreading, 3-cleft. Stamens 4, all anther-bearing, didynamous, ascending under the upper lip of the corolla, somewhat connivent in pairs, the longer mostly exserted; anthers 2-celled, the sacs divergent or divaricate. Ovary deeply 4-parted; style glabrous, 2-cleft at the summit. Nutlets ovoid, smooth. [Greek, bed-foot, the flowers likened to a bed-castor.]

About 50 species, natives of the north temperate zone. Besides the following, 3 others occur in the southeastern United States and in California. The genus has recently been included in *Satureia* by Briquet (Engler & Prantl, Nat. Pfl. Fam. 4: Abt. 3a, 296).

* Flower-clusters dense, axillary and terminal, setaceous-bracted. 1. *C. vulgare.*

* * Flower-clusters loose, axillary, or forming terminal thyrses; bracts small.

Plants pubescent; introduced species.
- Clusters peduncled; calyx not gibbous; upper leaves very small; perennials.
  - Leaves ¼′–1′ long; corolla somewhat exceeding the calyx. 2. *C. Nepeta.*
  - Leaves 1′–2′ long; corolla at least twice as long as the calyx. 3. *C. Calamintha.*
- Clusters sessile; calyx very gibbous; plant leafy, annual. 4. *C. Acinos.*

Plants glabrous; native species.
- Leaves linear or the lower spatulate, entire; corolla 4″ long. 5. *C. glabrum.*
- Leaves oblong or oblong-lanceolate, serrate; corolla 6″–7″ long. 6. *C. glabellum.*

1. Clinopodium vulgàre L. Field or Wild Basil. Basil-weed. (Fig. 3146.)

Clinopodium vulgare L. Sp. Pl. 587. 1753.
Melissa Clinopodium Benth. Lab. Gen. & Sp. 393. 1834.
Calamintha Clinopodium Benth. in DC. Prodr. 12: 233. 1848.

Perennial by short creeping stolons, hirsute; stem slender, erect from an ascending base, usually branched, sometimes simple, 1°–2° high. Leaves ovate or ovate-lanceolate, petioled, obtuse or acutish, entire, undulate or crenate-dentate, rounded, truncate or sometimes narrowed at the base, thin, 1′–2½′ long; flowers in dense axillary and terminal capitate clusters about 1′ in diameter; bracts setaceous, hirsute-ciliate, usually as long as the calyx-tube; calyx pubescent, somewhat gibbous, the setaceous teeth of its lower lip rather longer than the broader ones of the upper; corolla purple, pink, or white, little exceeding the calyx-teeth.

In woods and thickets, Nova Scotia to West Virginia, Minnesota and Manitoba, south in the Rocky Mountains to Colorado. Ascends to 4000 ft. in Virginia. Perhaps introduced eastward. Native of Europe and Asia. Called Stone Basil, Bed's-foot, Horse Thyme. June–Oct.

2. Clinopodium Népeta (L.) Kuntze. Field Balm. Lesser Calamint. (Fig. 3147.)

Melissa Nepeta L. Sp. Pl. 593. 1753.
Calamintha Nepeta Link & Hoffmansg. Fl. Port. 1: 14. 1809.
Clinopodium Nepeta Kuntze, Rev. Gen. Pl. 515. 1891.

Perennial from a woody root and short rootstocks, villous or pubescent; stem rather stout, at length much branched, the branches nearly straight, ascending. Leaves broadly ovate, petioled, obtuse or acute, crenulate with few low teeth, rounded or narrowed at the base, the lower ½′–1′ long, the upper much smaller and bract-like; flowers few in the numerous loose peduncled axillary cymes, forming an almost naked elongated thyrsus; bracts very small, linear; calyx not gibbous, villous in the throat, about 1½″ long, the teeth of its lower lip twice as long as those of the upper; corolla light purple or almost white, about 4″ long.

In fields and waste places, Maryland to North Carolina, west to Kentucky and Arkansas. Naturalized from Europe. Native also of Asia. June–Sept.

3. Clinopodium Calamíntha (L.) Kuntze. Calamint. Calamint Balm. Capmint. (Fig. 3148.)

Melissa Calamintha L. Sp. Pl. 593. 1753.
Calamintha officinalis Moench, Meth. 409. 1794.
Clinopodium Calamintha Kuntze, Rev. Gen. Pl. 515. 1891.

Perennial by creeping rootstocks, pubescent or hirsute; stem slender, branched, 1°–2½° high. Leaves broadly ovate, petioled, obtuse at both ends or subacute at the apex, dentate or crenate-dentate, 1′–2′ long and nearly as wide; inflorescence as in the preceding species, but commonly more leafy; peduncles of the lower flower-clusters usually longer than the petioles; calyx not gibbous, villous in the throat, 2″–3″ long, the teeth of the lower lip twice as long as those of the upper; corolla purplish, 6″–7″ long.

"Inclined to escape from cultivation in a few places" (according to Gray). Native of Europe and Asia. Mountain Mint. June–Aug.

4. Clinopodium Ácinos (L.) Kuntze. Basil Thyme. Basil Balm. (Fig. 3149.)

Thymus Acinos L. Sp. Pl. 591. 1753.
Melissa Acinos Benth. Lab. Gen. & Sp. 389. 1834.
Cal. Acinos Benth. in DC. Prodr. 12: 230. 1848.
Clin. Acinos Kuntze, Rev. Gen. Pl. 513. 1891.

Annual, pubescent; stems branched from the base, very slender, 6′–8′ high. Leaves oblong or ovate-oblong, petioled, acutish at both ends or the lower obtuse, crenulate or entire, 4″–8″ long; flowers about 6 in the axils, the clusters sessile; bracts shorter than the pedicels; calyx gibbous on the lower side, rough-hairy, longer than its pedicel, contracted at the throat, its subulate teeth somewhat unequal in length; corolla purplish, 1½–2 times as long as the calyx.

In waste places, New York and New Jersey. Adventive from Europe. Called also Mother-of-thyme, Polly Mountain. May–Aug.

5. Clinopodium glàbrum (Nutt.) Kuntze. Low Calamint or Bed's-foot. (Fig. 3150.)

Hedeoma glabra Nutt. Gen. 1: 16. 1818.
Cal. Nuttallii Benth. in DC. Prodr. 12: 230. 1848.
Calamintha glabella var. *Nuttallii* A. Gray, Man. Ed. 2, 307. 1856.
Clin. glabrum Kuntze, Rev. Gen. Pl. 515. 1891.

Perennial, glabrous, stoloniferous; stem very slender, at length much branched, erect or ascending, 4′–12′ high. Leaves of the flowering branches linear, entire, very short-petioled or sessile, mostly obtuse at the apex, obscurely veined, 4″–9″ long, ½″–1″ wide, the margins slightly revolute; lower leaves and those of the stolons shorter and broader, distinctly petioled; flowers 1–4 in the axils; bracts minute; pedicels filiform, mostly longer than the calyx; calyx not gibbous, its throat pubescent in a ring within, its lower teeth somewhat longer than the upper; corolla purple, about 4″ long.

On rocks and banks, western New York and southern Ontario to Illinois and Minnesota, south to Missouri and Texas. May–Aug.

6. Clinopodium glabéllum (Michx.) Kuntze. Slender Calamint or Bed's-foot. (Fig. 3151.)

Cunila glabella Michx. Fl. Bor. Am. 1:13. 1803.
Calamintha glabella Benth. in DC. Prodr. 12: 230. 1848.
Clinopodium glabellum Kuntze, Rev. Gen. Pl. 515. 1891.

Perennial, stoloniferous, glabrous; stems weak, spreading or decumbent, at length freely branched, elongated, slender, 8′–2° long. Leaves membranous, oblong, short-petioled, obtuse or the uppermost subacute at the apex, narrowed to a cuneate base, distinctly serrate with low teeth, 1′–2′ long, 2″–8″ wide, the lowest and those of the stolons sometimes proportionately broader and shorter; axils 2–5-flowered; pedicels filiform, commonly twice as long as the calyx; bracts minute; calyx not gibbous, its throat pubescent in a ring within, its teeth nearly equal; corolla purplish, 6″–7″ long.

On river banks, Kentucky and Tennessee. Rare and local. May–July.

29. HYSSÒPUS L. Sp. Pl. 569. 1753.

A perennial erect herb, the stem somewhat woody at the base, with narrow, entire leaves, and small bracted purple or blue flowers, in dense clusters in the upper axils, and forming elongated terminal more or less interrupted spikes. Calyx tubular, 15-nerved, about equally 5-toothed, not hairy in the throat. Corolla-limb 2-lipped, the upper lip erect, emarginate, the lower spreading, 3-cleft. Stamens 4, didynamous, the 2 longer ones exserted, divergent; anthers 2-celled, the sacs divaricate. Ovary deeply 4-parted; style 2-cleft at the summit. Nutlets ovoid, somewhat 3-sided, nearly smooth. [Greek, an aromatic herb.]

A monotypic genus of Europe and Asia.

1. Hyssopus officinàlis L. Hyssop. (Fig. 3152.)

Hyssopus officinalis L. Sp. Pl. 569. 1753.

Stems usually several together from the woody base, slender, strict, puberulent, simple or branched, 1°–3° high, the branches upright or ascending. Leaves linear to oblong, sessile or very nearly so, firm, acute at both ends or the lower obtuse at the apex, puberulent or glabrate, faintly veined, 1½′–2′ long, 1″–3″ wide, sometimes with smaller ones or short leafy branches in their axils; spike sometimes 1-sided, dense, ½′–1′ broad; pedicels short, puberulent; outer bracts as long as the calyx; calyx-teeth, lanceolate, acute, one-fourth to one-third as long as the tube; corolla 4″–5″ long, its tube exceeding the calyx.

Along roadsides and in waste places, Ontario and Maine to North Carolina, and on the Pacific Coast. Naturalized from Europe. June–Sept.

30. ORÍGANUM L. Sp. Pl. 588. 1753.

Perennial branching herbs, some species shrubby, with rather small crenate-dentate or entire leaves, and small bracted pink or purple flowers, in dense terminal glomerules. Calyx ovoid or campanulate, villous in the throat, about 13-nerved, 5-toothed or more or less 2-lipped. Corolla-limb 2-lipped, the upper lip erect, emarginate or 2-lobed, the lower longer, spreading, 3-cleft. Stamens 4, didynamous, ascending; anthers 2-celled, the sacs divergent. Style 2-cleft at the summit; ovary deeply 4-parted. Nutlets ovoid or oblong, smooth. [Greek, mountain-joy.]

About 30 species, natives of the Old World.

1. Origanum vulgàre L. Wild Marjoram. Organy. (Fig. 3153.)

Origanum vulgare L. Sp. Pl. 590. 1753.

Perennial from nearly horizontal rootstocks, villous or hirsute; stem erect, slender, 1°–2½° high. Leaves ovate, petioled, obtuse or subacute at the apex, rounded or subcordate at the base, crenate or entire, 1′–1½′ long, often with smaller ones, or short leafy branches, in their axils; flower-clusters often 2′ broad; bracts purplish, ovate or oval, about equalling the nearly regularly 5-toothed calyx; corolla pink, purple or nearly white, longer than the calyx, the upper lobe broad; all four stamens, or the two longer, exserted.

In fields and waste places, Ontario to New Jersey and Pennsylvania. Naturalized from Europe. Native also of Asia. Called also Organs, Pot Marjoram. July–Sept.

31. KOÈLLIA Moench, Meth. 407. 1794.

[Brachystemon and Pycnanthemum Michx. Fl. Bor. Am. 2: 5, 7. 1803.]

Perennial erect, mostly branched, glabrous cinereous canescent or pubescent herbs, with small white or purple-dotted flowers, in terminal or sometimes also axillary capitate glomerules or cymose clusters. Calyx ovoid, oblong or tubular, 10–13-nerved, equally or more or less unequally 5-toothed, not villous in the throat, the 2 upper teeth sometimes united below. Corolla 2-lipped, the upper lip emarginate or entire, the lower 3-cleft. Stamens 4, didynamous, nearly equal, or the lower pair a little longer; anther-sacs parallel. Ovary deeply 4-parted; style slender. Nutlets smooth, pubescent, or roughened. [Named for J. L. C. Koelle, a German botanist of the eighteenth century.]

About 14 species, natives of North America. Besides the following, 1 occurs in California and 1 or 2 in the southern States. The species apparently intergrade, and are thus difficult of discrimination. Mostly very fragrant. Sometimes called Basil, the proper name of Calaminth or Ocymum.

※ Leaves prevailingly linear, linear-lanceolate or oblong-lanceolate.

Calyx-teeth ovate-triangular, acute, one-fourth as long as the tube. — 2. *K. Virginiana.*
Calyx-teeth subulate, lance-subulate or bristle-tipped.
  Leaves linear or lanceolate; calyx-teeth subulate or lanceolate.
    Leaves linear or narrowly linear-lanceolate, entire. — 1. *K. flexuosa.*
    Leaves lanceolate, entire, or usually serrate.
      Bracts appressed, erect; clusters dense.
        Hirsute or pilose; leaves mainly entire. — 3. *K. pilosa.*
        Puberulent or glabrate; leaves mostly denticulate. — 4. *K. verticillata.*
      Bracts spreading; clusters loose. — 5. *K. clinopodioides.*
  Leaves oblong to linear-oblong, obtuse or subacute; calyx-teeth awn-like. — 6. *K. hyssopifolia.*

※ ※ Leaves prevailingly ovate, ovate-oblong or ovate-lanceolate.

Calyx-teeth bristle-tipped or subulate.
  Bracts appressed; clusters dense; calyx-teeth bristle-pointed. — 7. *K. aristata.*
  Bracts spreading; clusters loose; calyx-teeth subulate.
    Calyx-teeth about one-half as long as the tube. — 8. *K. incana.*
    Calyx-teeth as long as the tube. — 9. *K. pycnanthemoides.*
Calyx-teeth triangular, triangular-lanceolate or lanceolate.
  Bracts spreading; clusters loose; calyx-teeth short. — 10. *K. albescens.*
  Bracts appressed; clusters dense.
    Bracts canescent; leaves firm, acute. — 11. *K. mutica.*
    Bracts ciliate or villous; leaves membranous, acuminate. — 12. *K. montana.*

1. Koellia flexuòsa (Walt.) MacM. Narrow-leaved Mountain-Mint. (Fig. 3154.)

Satureja Thymus Virginicus L. Mant. 2: 409. 1771. Not *S. Virginica* L. 1753.
Origanum flexuosum Walt. Fl. Car. 165. 1788.
Pycnanthemum linifolium Pursh, Fl. Am. Sept. 409, 1814.
Koellia flexuosa MacM. Met. Minn. 452. 1892.

Stem slender, stiff, nearly glabrous throughout, 1½°–2½° high. Leaves linear or linear-lanceolate, entire, glabrous or the uppermost puberulent, sessile, or the lower very short-petioled, 1′–2′ long, ½″–1½″ wide, rather firm, often with short leafy branches in their axils; glomerules dense, terminal, cymose, 3″–5″ broad, canescent; bracts appressed, acuminate, or subulate-tipped, not longer than the clusters; calyx cylindraceous, canescent, its teeth subulate and rigid, equal or nearly so, 3–4 times longer than broad, about one-third as long as the tube; corolla pubescent or nearly glabrous, its tube longer than the calyx.

In fields and thickets, Massachusetts to Florida, Ontario, Minnesota and Texas. Little fragrant. July–Sept.

2. Koellia Virginiàna (L.) MacM. Virginia Mountain-Mint. (Fig. 3155.)

Satureja Virginiana L. Sp. Pl. 567. 1753.
P. lanceolatum Pursh, Fl. Am. Sept. 409. 1814.
Koellia Virginiana MacM. Met. Minn. 452. 1892.

Stem strict, rather stout, glabrous or pubescent, 1°–3° high. Leaves lanceolate or linear-lanceolate, fragraut, very short-petioled or sessile, firm, entire, acuminate at the apex, rounded or narrowed at the base, glabrous, or somewhat puberulent beneath, or the uppermost densely canescent, 1′–2′ long, 2″–5″ wide, often with short leafy branches in their axils; glomerules dense, 4″–6″ in diameter, terminal, cymose, canescent; bracts appressed, rigid, acute, acuminate or subulate-tipped, not exceeding the clusters; calyx cylindraceous, or expanded above, canescent, its teeth triangular-ovate, equal or nearly so, acute, little longer than wide, about one-fourth as long as the tube; corolla pubescent without, purple-spotted, its tube longer than the calyx.

In dry fields and thickets, Quebec and Ontario to Minnesota, south to Georgia, Alabama and Nebraska. Virginia Thyme, Prairie Hyssop. July–Sept.

3. Koellia pilòsa (Nutt.) Britton. Hairy Mountain-Mint. (Fig. 3156.)

Pycnanthemum pilosum Nutt. Gen. 2: 33. 1818.
Pycnanthemum muticum var. *pilosum* A. Gray, Syn. Fl. 2: Part 1, 355. 1878.
Koellia pilosa Britton, Mem. Torr. Club, 5: 279. 1894.

Pubescent, at least above, 1°–2½° high. Leaves lanceolate, very short-petioled or sessile, entire or very sparingly denticulate, 1′–2′ long, 3″–6″ wide, firm, acuminate at the apex, mostly narrowed at the base, commonly with smaller ones, or short leafy shoots in their axils; glomerules dense, numerous, terminal, cymose, villous or hirsute-canescent, about 4″ in diameter; bracts lanceolate, acuminate, equalling or exceediug the clusters; calyx cylindraceous, narrow, canescent, its teeth lanceolate-subulate, equal, about 3 times as long as wide and one-fourth to one-third the length of the tube; corolla pubescent, its tube little longer than the calyx.

On prairies and in dry woods, Ohio to Georgia, west to Missouri and Arkansas. July–Sept.

4. Koellia verticillàta (Michx.) Kuntze. Torrey's Mountain-Mint. (Fig. 3157.)

Brachystemon verticillatum Michx. Fl. Bor. Am. 2: 6. *pl. 31.* 1803.
P. Torreyi Benth. Lab. Gen. & Sp. 329. 1834.
Koellia verticillata Kuntze, Rev. Gen. Pl. 520. 1891.

Puberulent, glabrate or pubescent; stem slender, 1°–2½° high. Leaves lanceolate, oblong-lanceolate or linear-lanceolate (rarely ovate-lanceolate), short-petioled or sessile, serrulate or entire, acute or acuminate at the apex, rounded or narrowed at the base, 1′–3′ long, 3″–10″ wide, the uppermost sometimes canescent; flower-clusters dense, canescent, 5″–6″ broad, terminal, cymose and commonly also in some of the upper axils; bracts appressed, lanceolate, acuminate, equalling or longer than the clusters; calyx canescent, its teeth subulate or lance-subulate, 2–3 times as long as wide, one-fourth to one-third as long as the tube; corolla pubesceut, its tube rather exceeding the calyx.

In dry fields and thickets, Rhode Island to Virginia, west to Missouri. July–Sept.

5. Koellia clinopodioides (T. & G.) Kuntze. Basil Mountain-Mint. (Fig. 3158.)

Pycnanthemum clinopodioides T. & G.; A. Gray, Am. Journ. Sci. 42: 45. 1842.
Koellia clinopodioides Kuntze, Rev. Gen. Pl. 520. 1891.

Pubescent or puberulent; stem slender, 1°–2½° high. Leaves lanceolate or oblong-lanceolate, rather thin, short-petioled, sharply serrate, or the upper entire, 1½′–3′ long, 5″–12″ wide, none of them canescent; flower-clusters loose, terminal and axillary, about 1′ broad; bracts linear-acuminate or subulate-tipped, not exceeding the clusters, some or all of them spreading; calyx finely canescent or glabrate, its teeth subulate, sometimes with a few long hairs, slightly unequal, about one-fourth the length of the tube; corolla-tube longer than the calyx.

In dry soil, southern New York and Pennsylvania to eastern Tennessee. Ascends to 5000 ft. in Virginia. Aug.–Sept.

6. Koellia hyssopifòlia (Benth.) Britt. Hyssop Mountain-Mint. (Fig. 3159.)

P. hyssopifolium Benth. Lab. Gen. & Sp. 329. 1834.
Pycnanthemum aristatum var. *hyssopifolium* A. Gray, Syn. Fl. 2: Part 1, 354. 1878.
K. hyssopifolia Britton, Mem. Torr. Club, 5: 279. 1894.

Puberulent or glabrate; stem slender, stiff, 1°–3° high. Leaves oblong, linear-oblong, or lanceolate-oblong, short-petioled, or the upper sessile, obtuse or subacute at the apex, narrowed at the base, entire or denticulate, ½′–1½′ long, 2″–6″ wide, glabrous or minutely canescent; flower-clusters dense, minutely canescent, not at all villous, terminal and cymose, and usually also in the upper axils, often 1′ broad; bracts linear-oblong, narrowed at each end, terminated by an awn almost as long as the body; calyx cylindraceous, glabrous or very nearly so, prominently nerved, its teeth bristle-pointed, slightly widened below, nearly as long as the tube; corolla-tube not longer than calyx.

In dry soil, Virginia to Florida. June–Aug.

7. Koellia arista̍ta (Michx.) Kuntze. Awned Mountain-Mint. (Fig. 3160.)

Pycnanthemum aristatum Michx. Fl. Bor. Am. 2: 8. *pl. 33.* 1803.
Koellia aristata Kuntze, Rev. Gen. Pl. 520. 1891.

Similar to the preceding species; stem slender, stiff, minutely canescent, 1½°–2½° high. Leaves ovate, or some of them ovate-lanceolate, short-petioled, sharply serrate, serrulate, or the upper entire, acute at the apex, rounded at the base, 1′–2′ long, 4″–12″ wide, the uppermost usually minutely canescent; inflorescence as in the preceding species; bracts long-awned, appressed, the awn about one-third the length of the body; calyx canescent, its teeth equal, bristle-pointed, widened below, one-third to one-half as long as the tube; corolla-tube about equalling the calyx.

In dry pine barrens, New Jersey to Florida and Louisiana, mostly near the coast. July–Sept.

8. Koellia incàna (L.) Kuntze. Hoary Mountain-Mint. (Fig. 3161.)

Clinopodium incanum L. Sp. Pl. 588. 1753.
Pycnanthemum incanum Michx. Fl. Bor. Am. 2:7. 1803.
Koellia incana Kuntze, Rev. Gen. Pl. 520. 1891.

Stem pubescent, or glabrous below, stout, 1½°–3° high. Leaves thin, ovate to ovate-lanceolate, petioled, acute at the apex, sharply serrate or serrulate, white-canescent beneath, puberulent or glabrous above, 1½′–3′ long, ½′–1½′ wide, or the uppermost smaller and sometimes canescent on both sides; clusters loose, terminal and in the upper axils, 1′–1½′ broad, canescent, the flowers sometimes secund on their branches; bracts linear, or the outer broader, canescent or slightly villous, spreading, mostly shorter than the clusters; calyx canescent, slightly 2-lipped, its teeth subulate, somewhat unequal, the longer one-fourth to one-half as long as the tube, rarely villous; corolla-tube equalling or longer than the calyx.

Dry thickets and hillsides, Maine to Ontario, Ohio and Florida. Also called Wild Basil. Aug.–Oct.

9. Koellia pycnanthemoides (Leavenw.) Kuntze. Southern Mountain-Mint. (Fig. 3162.)

Tullia pycnanthemoides Leavenw. Am. Journ. Sci. 20: 343. *pl. 5.* 1830.
P. Tullia Benth. Lab. Gen. & Sp. 328. 1834.
K. pycnanthemoides Kuntze, Rev. Gen. Pl. 520. 1891.

Stem rather stout, pubescent nearly to the base, 2°–3° high. Leaves membranous, petioled, mostly ovate-lanceolate, acuminate or acute at the apex, narrowed at the base, sharply serrate, pubescent beneath, puberulent or glabrate above, 1½′–3½′ long, ½′–1½′ wide, the lower green, the upper smaller and white-canescent on both sides; clusters loose, villous and canescent, terminal and axillary, 1′–2′ broad, the flowers often secund; bracts linear-oblong, acuminate or subulate-tipped, spreading, mostly shorter than the mature clusters; calyx-teeth very unequal, subulate, densely villous, the longer about equalling the tube; corolla-tube not exceeding the calyx.

In dry woods and on hills, Virginia to Georgia and Tennessee. Ascends to 3000 ft. in Virginia. July–Sept.

10. Koellia albéscens (T. & G.) Kuntze. White-leaved Mountain-Mint. (Fig. 3163.)

P. albescens T. & G.; A. Gray, Am. Journ. Sci. 42:45. 1842.
Koellia albescens Kuntze, Rev. Gen. Pl. 520. 1891.

Stem slender, soft-pubescent nearly to the base, 1°–2° high. Leaves ovate to ovate-lanceolate, petioled, acute or subacuminate at the apex, narrowed or sometimes rounded at the base, sharply serrate or nearly entire, 1′–2½′ long, ½′–1¼′ wide, white-canescent beneath, green above, or the upper canescent on both sides; clusters loose, terminal and axillary, densely canescent, not at all villous, at length about 1′ broad; bracts linear, or the outer broader, spreading, sometimes exceeding the clusters; calyx densely canescent, its teeth triangular, obtuse or acute, slightly unequal, one-fifth to one-fourth as long as the tube; corolla-tube longer than the calyx.

In dry woods and thickets, southern Virginia to Missouri and Arkansas, south to Florida and Texas. July–Sept.

11. Koellia mùtica (Michx.) Britt. Short-toothed Mountain-Mint. (Fig. 3164.)

Brachystemon muticum Michx. Fl. Bor. Am. 2: 6. *pl. 32.* 1803.
Koellia mutica Britton, Mem. Torr. Club, 4: 145. 1894.

Stem stiff, puberulent, or glabrous below, 1°–2½° high. Leaves short-petioled or sessile, ovate or ovate-lanceolate, firm, acute at the apex, rounded or sometimes subcordate at the base, sharply serrate or serrulate, 1½′–3′ long, ½′–1½′ wide, the lower mostly glabrous, the uppermost white-canescent on both sides, much smaller; flower-clusters capitate, dense, terminal, cymose, often also in the upper axils, pubescent or canescent, 4″–6″ broad; bracts appressed, lanceolate-subulate or the outer broader; calyx pubescent, its teeth nearly equal, triangular-ovate or triangular-lanceolate, not much longer than wide, about one-fifth as long as the tube; corolla-tube exceeding the calyx.

In sandy soil, Maine to Virginia and Florida, west to Missouri. July–Sept.

12. Koellia montàna (Michx.) Kuntze. Thin-leaved Mountain-Mint. (Fig. 3165.)

Pycnanthemum montanum Michx. Fl. Bor. Am. 2: 8. 1803.
Monardella montana Benth. Lab. Gen. & Sp. 331. 1834.
Koellia montana Kuntze, Rev. Gen. Pl. 520. 1891.

Stem slender, glabrous or nearly so throughout, 2°–3° high. Leaves distinctly petioled, membranous, glabrous, ovate-lanceolate or the upper lanceolate, long-acuminate at the apex, usually narrowed at the base, sharply serrate, 2′–5′ long, ½′–2′ wide, none of them canescent; flower-clusters rather dense, terminal and in the upper axils, ½′–1′ broad; bracts appressed, lanceolate or linear-lanceolate, acuminate, not exceeding the fully developed clusters, bearded more or less with long hairs; calyx tubular, glabrous or puberulent, or villous above, its teeth triangular-subulate, equal, one-fifth to one-fourth as long as the tube; corolla-tube longer than the calyx.

In woods, mountains of southern Virginia to Georgia, Tennessee and Alabama. July–Sept.

32. THÝMUS L. Sp. Pl. 590. 1753.

Perennial herbs, or low shrubby creeping plants, with small mostly entire leaves, and small purple flowers clustered in terminal glomerules, or in the axils of the leaves. Calyx ovoid, villous in the throat, 10–13-nerved, 2-lipped, the upper lip erect-spreading, 3-toothed, the lower 2-toothed, its teeth long and slender. Corolla-limb 2-lipped, the upper lip erect, emarginate, the lower spreading, 3-cleft. Stamens 4, more or less didynamous, mostly exserted; anthers 2-celled, the sacs parallel or divergent. Ovary deeply 4-parted; style 2-cleft at the summit. Nutlets ovoid or oblong, smooth. [Greek, incense.]

About 50 species, natives of the Old World, mostly European.

1. Thymus Serpýllum L. Wild or Creeping Thyme. Mother of Thyme. (Fig. 3166.)

Thymus Serpyllum L. Sp. Pl. 590. 1753.

Stems more or less pubescent in lines, very slender, procumbent, tough, much branched, 4′–12′ long, commonly forming dense mats. Leaves oblong or ovate-oblong, petioled, obtuse at the apex, usually narrowed at the base, entire, glabrous, or sometimes ciliate, 2″–5″ long; bracts similar to the leaves, but smaller; flowers numerous in verticillate clusters crowded in dense short terminal spikes, or also in the upper axils; calyx distinctly 2-lipped, the tube usually pubescent and the teeth ciliate; corolla longer than the calyx.

In thickets, woods, and along roadsides, Nova Scotia to southern New York and Pennsylvania. Naturalized from Europe. Native also of Asia. June–Sept. Old English names, Brotherwort, Hillwort, Penny Mountain, Shepherd's Thyme.

33. CUNÌLA L. Syst. Ed. 10, 1359. 1759.

Perennial branching herbs, or low shrubs, with dentate or entire leaves, and rather small purple or white flowers. Calyx tubular-ovoid, 10–13-nerved, villous in the throat, equally 5-toothed. Corolla 2-lipped, longer than the calyx, the upper lip erect, emarginate, the lower spreading, 3-cleft. Anther-bearing stamens 2, long-exserted, straight, the posterior pair rudimentary, or wanting; anther-sacs parallel. Ovary deeply 4-parted; style slender, 2-cleft at the summit. Nutlets smooth; scar of attachment basal and small. [Latin name of some plant.]

About 15 species, natives of America. The following is the only one known in North America.

1. Cunila origanoìdes (L.) Britton. Stone Mint. Sweet Horse-Mint. American Dittany. (Fig. 3167.)

Satureia origanoides L. Sp. Pl. 568. 1753.
Cunila Mariana L. Syst. Ed. 10, 1359. 1759.
Hedyosmos origanoides Kuntze, Rev. Gen. Pl. 520. 1891.
Cunila origanoides Britton, Mem. Torr. Club, 5: 278. 1894.

Stem slender, stiff, branched, glabrous, or pubescent at the nodes, erect, 8′–20′ high, the branches ascending. Leaves ovate, sessile or very short-petioled, acute at the apex, sharply serrate, rounded, truncate or subcordate at the base, ½′–1½′ long, densely punctate; flowers nearly ½′ long, numerous in terminal loose cymose clusters; corolla purple-pink, one-half as long as the stamens; posterior pair of stamens usually rudimentary.

In dry woods and thickets, southern New York to Florida, west to Ohio and Georgia. Plant very aromatic. Aug–Sept.

34. LÝCOPUS L. Sp. Pl. 21. 1753.

Herbs, perennial by slender stolons or suckers, with erect or diffuse stems, petioled or sessile leaves, and small white or purple flowers, bracted and verticillate in dense axillary clusters. Calyx campanulate, regular or nearly so, 4–5-toothed, not bearded in the throat, the teeth obtuse or acute. Corolla funnelform-campanulate to cylindric, equalling or longer than the calyx, the limb nearly equally 4-cleft, or one of the lobes broader and emarginate. Perfect stamens 2, anterior, the posterior pair rudimentary, or altogether wanting; anther-sacs parallel. Ovary deeply 4-parted; style slender, 2-cleft at the summit. Nutlets truncate at the summit, narrowed below, trigonous, smooth. [Greek, wolf-foot.]

About 10 species of the north temperate zone. Only the following known in North America.

Calyx-teeth mostly 4, ovate, shorter than the nutlets. — 1. *L. Virginicus.*
Calyx-teeth mostly 5, lanceolate or subulate, longer than the nutlets.
  Bracts minute; corolla twice as long as the calyx.
    Leaves sessile. — 2. *L. sessilifolius.*
    Leaves narrowed into a manifest petiole. — 3. *L. rubellus.*
  Bracts lanceolate or subulate; corolla not twice as long as the calyx.
    Leaves pinnatifid or deeply incised. — 4. *L. Americanus.*
    Leaves merely coarsely dentate or serrate (lower rarely incised).
      Leaves oblong or oblong-lanceolate, serrate. — 5. *L. lucidus.*
      Leaves ovate, coarsely dentate. — 6. *L. Europaeus.*

1. Lycopus Virgínicus L. Bugle-weed. Bugle-wort. (Fig. 3168.)

Lycopus Virginicus L. Sp. Pl. 21. 1753.

Perennial by long filiform leafy sometimes tuber-bearing stolons, glabrous or puberulent; stem slender, erect or ascending, simple or branched, 6′–2° high. Leaves oblong, lanceolate or ovate-lanceolate, acuminate at the apex, sharply dentate, narrowed or cuneate at the base, petioled, or the upper sessile, 1½′–3′ long, ½′–1½′ wide; bracts short, oblong; calyx-teeth 4, or sometimes 5, ovate or ovate-lanceolate, obtuse or subacute; corolla about 1″ broad, nearly twice as long as the calyx, or longer; rudimentary posterior stamens minute; nutlets longer than or about equalling the calyx.

In wet soil, Labrador to British Columbia, south to Florida, Alabama, Missouri and Nebraska. Sometimes called Wood Betony. Leaves often purple. Stem usually thickened at the base. Variable. Probably includes several species. July–Sept.

2. Lycopus sessilifòlius A. Gray. Sessile-leaved Water Hoarhound. (Fig. 3169.)

Lycopus Europaeus var. *sessilifolius* A. Gray, Man. Ed. 5, 345. 1867.
Lycopus sessilifolius A. Gray, Proc. Am. Acad. 8: 285. 1870.

Glabrous, or puberulent above, perennial by stolons and suckers; stem simple, or at length branched, erect, 1°–2° high. Leaves ovate-lanceolate or oblong-lanceolate, closely sessile, acute or acuminate at the apex, sharply serrate, somewhat narrowed at the base, 1′–2′ long; bracts very small, acute; calyx-teeth usually 5, subulate, rigid, nearly as long as the tube; corolla twice as long as the calyx; rudimentary posterior stamens oval; nutlets shorter than the calyx.

In wet soil, Long Island, N. Y., to Florida, near the coast. Aug.–Oct.

3. Lycopus rubéllus Moench. Stalked Water Hoarhound. (Fig. 3170.)

Lycopus rubellus Moench, Meth. Suppl. 146. 1802.
Lycopus Europaeus var. *integrifolius* A. Gray, Man. Ed. 5, 346. 1867.

Glabrous or minutely puberulent, perennial by leafy stolons; stem erect or ascending, simple or at length freely branched, 1°–3° high. Leaves ovate to oblong-lanceolate, or narrower, acuminate at the apex, sharply dentate, narrowed or cuneate at the base, 2′–5′ long, ½′–1½′ wide, usually tapering into a conspicuous petiole; bracts minute, acute or acuminate; calyx-teeth triangular-subulate, herbaceous, one-half as long as the tube or more; corolla longer than the calyx; rudimentary posterior stamens oval or oblong; nutlets much shorter than the calyx.

In wet soil, southern New York to Florida, Ohio, Arkansas and Louisiana. July–Oct.

4. Lycopus Americànus Muhl. Cut-leaved Water Hoarhound. (Fig. 3171.)

L. Americanus Muhl.; Bart. Fl. Phil. Prodr. 15. 1815.
Lycopus sinuatus Ell. Bot. S. C. & Ga. 1: 26. 1817.
Lycopaeus Europaeus var. *sinuatus* A. Gray, Man. Ed. 5, 346. 1867.

Puberulent or glabrous, perennial by suckers; stem stiff, erect, simple or branched, 1°–2° high. Leaves lanceolate or ovate-lanceolate in outline, petioled, acuminate at the apex, incised, pinnatifid or the uppermost merely serrate, 2′–4′ long; bracts subulate, the outer ones sometimes exceeding the calyx; calyx-teeth triangular-subulate, cuspidate, rigid; corolla little exceeding the calyx; rudimentary posterior stamens thickened at their tips; nutlets much shorter than the calyx.

In wet soil, Newfoundland to British Columbia, south to Florida, Texas, Utah and California. June–Oct.

5. **Lycopus lùcidus** Turcz. Western Water Hoarhound. (Fig. 3172.)

L. lucidus Turcz.; Benth. in DC. Prodr. 12: 178. 1848. *Lycopus lucidus* var. *Americanus* A. Gray, Proc. Am. Acad. 8: 286. 1870.

Pubescent or glabrate, perennial by stolons; stem usually stout, erect, strict, leafy, simple, or sometimes branched, 1°–3° high. Leaves oblong-lanceolate, acute at the apex, narrowed or rounded at the base, sessile, or very short-petioled, 2′–6′ long, ¼′–1½′ wide, sharply serrate with acute ascending teeth; bracts ovate or lanceolate, acuminate-subulate, the outer ones often as long as the flowers; calyx-teeth 5, subulate-lanceolate, nearly as long as the tube; corolla little longer than the calyx; rudimentary stamens slender, thickened at the tips; nutlets much shorter than the calyx.

In wet soil, Minnesota to Kansas, west to British Columbia, California and Arizona. Also in northern Asia. July–Sept.

6. **Lycopus Europaèus** L. Water or Marsh Hoarhound. Gipsy-wort. Gipsy-herb. (Fig. 3173.)

Lycopus Europaeus L. Sp. Pl. 21. 1753.

Puberulent or pubescent, perennial by suckers; stems stout, at length widely branched, 1°–2½° high. Leaves ovate, ovate-oblong, or oblong-lanceolate, short-petioled, or the upper sometimes sessile, coarsely dentate, or the lower incised at the base, 1′–3′ long, ½′–1′ wide; bracts subulate-lanceolate, the outer shorter than or equalling the flowers; calyx-teeth subulate-spinulose; corolla scarcely longer than the calyx; rudimentary posterior stamens obsolete; nutlets shorter than the calyx.

In waste places, southern New York to Virginia. Naturalized from Europe. July–Sept.

35. MÉNTHA L. Sp. Pl. 576. 1753.

Erect or diffuse odorous herbs, with simple sessile or petioled mostly punctate leaves, and small whorled purple pink or white flowers, the whorls axillary or in terminal dense or interrupted spikes. Calyx campanulate to tubular, 10-nerved, regular, or slightly 2-lipped, 5-toothed. Corolla-tube shorter than the calyx, the limb 4-cleft, somewhat irregular, the posterior lobe usually somewhat broader than the others, entire or emarginate. Stamens 4, equal, erect, included or exserted, sometimes imperfect; filaments glabrous; anthers 2-celled, the sacs parallel. Ovary 4-parted; style 2-cleft at the summit. Nutlets ovoid, smooth. [Name used by Theophrastus; from the nymph Minthe.]

About 30 species, natives of the north temperate zone. The more or less characteristic odors of the species change during the progress of the life of the plant. The following occur in North America.

* Whorls of flowers in terminal spikes, or some in the upper axils.

Plants glabrous or very nearly so.
- Spikes slim, narrow, mostly interrupted; leaves sessile, or nearly so. — 1. *M. spicata.*
- Spikes thick, mostly dense, at first short; leaves petioled.
  - Leaves lanceolate or oblong, acute. — 2. *M. piperita.*
  - Leaves ovate, obtuse, or the upper acute, subcordate. — 3. *M. citrata.*

Plants villous, hirsute or canescent, at least at the nodes.
- Spikes slim or narrow, often interrupted.
  - Leaves lanceolate or ovate-lanceolate, acute. — 4. *M. longifolia.*
  - Leaves elliptic or ovate-oblong, obtuse, reticulated beneath. — 5. *M. rotundifolia.*
- Spikes thick (6″), dense, elongated or short.
  - Leaves sessile; spikes 1′–3′ long; plant canescent. — 6. *M. alopecuroides.*
  - Leaves distinctly petioled, or the uppermost sessile; spikes short.
    - Leaves simply serrate. — 7. *M. aquatica.*
    - Leaves mostly incised, the margins crisped and wavy. — 8. *M. crispa.*

* * Whorls of flowers all axillary.

Leaves crenate-dentate; calyx teeth triangular, short. — 9. *M. arvensis.*

Leaves sharply serrate; calyx-teeth subulate.
Calyx-teeth ciliate, the tube glabrous; leaves ovate. 10. *M. gentilis.*
Calyx densely or sparsely pubescent all over.
Leaves ovate, pubescent on both sides; hairs of the stem reflexed. 11. *M. sativa.*
Leaves oblong or ovate-oblong, nearly or quite glabrous. 12. *M. Canadensis.*

1. Mentha spicàta L. Spearmint. Our Lady's Mint. (Fig. 3174.)

Mentha spicata L. Sp. Pl. 576. 1753.
Mentha spicata var. *viridis* L. loc. cit. 1753.
Mentha viridis L. Sp. Pl. Ed. 2, 804. 1763.

Glabrous, perennial by leafy stolons; stem erect, branched, 1°–1½° high. Leaves lanceolate, sessile or short-petioled, sharply serrate, acute or acuminate at the apex, narrowed at the base, the largest about 2½′ long; whorls of flowers in terminal narrow acute usually interrupted spikes, which become 2′–4′ long in fruit, the one terminating the stem surpassing the lateral ones; bracts subulate-lanceolate, ciliate, some of them usually longer than the flowers; calyx campanulate, its teeth hirsute or glabrate, subulate, nearly as long as the tube; corolla glabrous.

In moist fields or waste places, Nova Scotia to Ontario, Minnesota and Utah, south to Florida and Kansas. Naturalized from Europe. Native also of Asia. Other names are Garden-, Brown- or Mackerel-Mint, Sage o Bethlehem. July–Sept.

2. Mentha piperìta L. Peppermint. (Fig. 3175.)

Mentha piperita L. Sp. Pl. 576. 1753.

Perennial by subterranean suckers; stems glabrous, mostly erect, branched, 1°–3° high. Leaves lanceolate, petioled, dark green, acute at the apex, rounded or narrowed at the base, rather firm, sharply serrate, glabrous on both sides, or pubescent on the veins beneath, the larger 1½′–3′ long, 1′–1½′ wide; whorls of flowers in terminal dense or interrupted spikes, which are thick and obtuse, and become 1′–3′ long in fruit, the middle one at length overtopped by the lateral ones; bracts lanceolate, acuminate, not longer than the flowers, or the lower occasionally foliaceous; calyx tubular-campanulate, glabrous below, its teeth subulate, usually ciliate, one-half as long as the tube or more; corolla glabrous; style occasionally 3-cleft.

In wet soil, Nova Scotia to Ontario and Minnesota, south to Florida and Tennessee. Naturalized from Europe. Lamb- or Brandy-Mint. July–Sept.

3. Mentha citràta Ehrh. Bergamot Mint. (Fig. 3176.)

Mentha citrata Ehrh. Beitr. 7: 150. 1792.

Perennial by leafy stolons, glabrous throughout; stem weak, branched, decumbent or ascending, 1°–2° long. Leaves petioled, thin, ovate or ovate-orbicular, obtuse or the upper acute at the apex, rounded or subcordate at the base, sharply serrate with low teeth, the larger about 2′ long, 1′–1½′ wide; whorls of flowers in terminal dense thick obtuse spikes, and commonly also in the uppermost axils; spikes scarcely more than 1′ long in fruit; calyx glabrous, its teeth subulate, one-half as long as the tube, or longer; corolla glabrous.

In wet soil, Staten Island, N. Y., and Ohio. Adventive from Europe. July–Sept.

4. Mentha longifòlia (L.) Huds. Horse Mint. (Fig. 3177.)

Mentha spicata var. *longifolia* L. Sp. Pl. 576. 1753.
Mentha longifolia Huds. Fl. Angl. 221. 1762.
Mentha sylvestris L. Sp. Pl. Ed. 2, 804. 1763.

Perennial by suckers, canescent or puberulent nearly all over; stems mostly erect, branched, or simple, 1°–2½° high. Leaves lanceolate, ovate-lanceolate, or oblong-lanceolate, sessile, or very short-petioled, acute at the apex, usually rounded at the base, sharply serrate, 1′–3′ long, ½′–1¼′ wide, sometimes glabrous above; whorls of flowers in terminal narrow dense or interrupted acute spikes, which become 2′–5′ long in fruit; bracts lanceolate-subulate, the lower equalling or longer than the flowers; calyx tomentose or canescent, its teeth subulate, one-half as long as the campanulate tube; corolla puberulent.

In waste places, Pennsylvania and New Jersey. Naturalized from Europe. Called also Brook- or Fish-Mint, and formerly Water-Mint. July-Oct.

5. Mentha rotundifòlia (L.) Huds. Round-leaved Mint. (Fig. 3178.)

Mentha spicata var. *rotundifolia* L. Sp. Pl. 576. 1753.
Mentha rotundifolia Huds. Fl. Angl. 221. 1762.

Perennial by leafy stolons, canescent or tomentose-puberulent, somewhat viscid; stems ascending or erect, simple or branched, usually slender, 1½°–2½° high. Leaves elliptic, or ovate-oblong, short-petioled, or sessile and somewhat clasping y the subcordate or rounded base, obtuse at the apex, crenate-serrate with low teeth, 1′–2′ long, 9″–15″ wide, more or less rugose-reticulated beneath; whorls of flowers in terminal dense or interrupted spikes which elongate to 2′–4′ in fruit; bracts lanceolate, acuminate, commonly shorter than the flowers; calyx-teeth setaceous, usually about one-half as long as the tube; corolla puberulent.

In waste places, Maine to North Carolina, Texas and Mexico. Called also Apple Mint, Horse Mint, Wild Mint. July–Sept.

6. Mentha alopecuroìdes Hull. Woolly Mint. (Fig. 3179.)

Mentha alopecuroides Hull. Brit. Fl. 221. 1799.

Perennial by suckers, white-woolly; stem stout, leafy, erect or ascending, simple or branched, 1½°–3° high. Leaves broadly oval, sessile, or partly clasping by a subcordate or rarely rounded base, obtuse at the apex, sharply and rather coarsely serrate, pinnately-veined, the lower 2′–3′ long, 1½′–2′ wide; spikes rather thick, dense, stout, obtuse, 2′–3′ long in fruit; bracts lanceolate, shorter than the flowers; calyx-teeth setaceous, one-half as long as the campanulate tube, or more; corolla pubescent.

Along roadsides, southern New York, New Jersey and Pennsylvania to Missouri. Naturalized from Europe. July-Oct.

7. Mentha aquática L. Water Mint. Fish Mint. (Fig. 3180.)

Mentha aquatica L. Sp. Pl. 576. 1753.

Perennial by suckers, hirsute or pubescent, rarely glabrate; stem stout, erect, leafy, usually branched, 1½°–2½° high, its hairs reflexed. Leaves broadly ovate, petioled, acute, subacute or the lower obtuse at the apex, rounded, subcordate or rarely narrowed at the base, sharply serrate, the larger 1½′–3′ long and nearly as wide; whorls of flowers in terminal dense short thick rounded spikes, and usually also in the upper axils; spikes seldom more than 1′ long in fruit; bracts lanceolate, shorter than the flowers; calyx hirsute, its teeth lanceolate-subulate or triangular-lanceolate, one-third to one-half as long as the nearly cylindric tube; corolla sparingly pubescent.

In wet places, Nova Scotia to Pennsylvania and Georgia. Naturalized from Europe. Aug.–Oct.

8. Mentha críspa L. Crisped-leaved, Curled or Cross Mint. (Fig. 3181.)

Mentha crispa L. Sp. Pl. 576. 1753.
Mentha aquatica var. *crispa* Benth. Lab. Gen. & Sp. 177. 1833.

Sparingly pilose pubescent at least at the nodes, petioles and veins of the lower surfaces of the leaves; stem rather weak, usually much branched, 1½°–3° long. Leaves distinctly petioled, or the uppermost sessile, ovate in outline, mostly acute at the apex, rounded, truncate or subcordate at the base, their margins crisped, wavy and incised, or the uppermost merely sharply serrate; whorls of flowers in dense thick rounded terminal spikes, which become 1′–1½′ long in fruit; calyx sparingly pubescent or glabrous, its teeth subulate, more than one-half as long as the campanulate tube; corolla glabrous.

In swamps and roadside ditches, southern New York, New Jersey and Pennsylvania. Aug.–Oct.

9. Mentha arvénsis L. Corn Mint. Field Mint. (Fig. 3182.)

Mentha arvensis L. Sp. Pl. 577. 1753.

Perennial by suckers, pubescent or glabrate; stems erect or ascending, simple or branched, 6′–2° high, slender. Leaves oblong-lanceolate, oval or ovate, petioled, acute at the apex or the lower obtuse, crenate-serrate with bluntish teeth, mostly narrowed at the base, 1′–2½′ long, ½′–1′ wide, the upper not much smaller than the ower; whorls of flowers all axillary, usually about equalling the petioles; calyx pubescent, campanulate, its teeth triangular, about as long as the width of their base, acute or sometimes obtuse, one-third as long as the tube.

In dry waste places, New Brunswick, northern New York to New Jersey, Pennsylvania and Florida. Also in California and Mexico. Naturalized from Europe. Called also Lamb's-tongue and Wild Pennyroyal. July–Sept.

10. Mentha gentilis L. Creeping or Downy Whorled Mint. (Fig. 3183.)

Mentha gentilis L. Sp. Pl. 577. 1753.

Perennial by suckers; stem rather stout, ascending or erect, branched, puberulent with short reflexed hairs, 1°–2° high. Leaves ovate or oval, short-petioled, sparingly pubescent with scattered hairs on both surfaces, often blotched, pinnately veined, acute at both ends, sharply serrate, the larger 1½′–2′ long, the upper sometimes much smaller than the lower; whorls of flowers all axillary; pedicels glabrous; calyx campanulate, glabrous below, its teeth subulate, ciliate, one-half as long as the tube; corolla glabrous.

In waste places and along streams, Maine to northern New York, New Jersey and Pennsylvania. Naturalized from Europe. Aug.-Oct.

11. Mentha sativa L. Marsh Whorled Mint. (Fig. 3184.)

Mentha sativa L. Sp. Pl. Ed. 2, 805. 1763.

Perennial by suckers; stem ascending, usually widely branched, densely pubescent with sometimes reflexed hairs, 1°–3° long. Leaves ovate, short-petioled, pubescent on both sides, acute at the apex, mostly rounded at the base, sharply serrate, the larger 1′–2′ long, the upper sometimes much smaller; whorls of flowers all axillary, commonly surpassing the petioles; calyx campanulate, pubescent all over, its triangular-subulate teeth one-half as long as the tube; pedicels pubescent or glabrous.

In waste places, Nova Scotia to Pennsylvania. Naturalized from Europe. July–Sept.

12. Mentha Canadénsis L. American Wild Mint. (Fig. 3185.)

Mentha Canadensis L. Sp. Pl. 577. 1753.
Mentha borealis Michx. Fl. Bor. Am. 2: 2. 1803.
Mentha Canadensis var. *glabrata* Benth. in DC. Prodr. 12: 173. 1848.

Perennial by suckers; stem more or less pubescent with spreading or scarcely reflexed hairs, or glabrate, erect, simple, or branched, usually slender, 6′–2½° high. Leaves oblong or ovate-oblong, or oblong-lanceolate, slender-petioled, acute at the apex, or the lower obtuse, sharply serrate, narrowed to a somewhat cuneate acute or obtuse base, glabrous or very sparingly pubescent, the larger 2′–3′ long, ½′–1′ wide; whorls of flowers all axillary, often shorter than the petioles; calyx oblong-campanulate, densely or sparingly pubescent all over, its teeth one-fourth to one-third as long as the tube.

In moist soil, New Brunswick to the Northwest Territory and British Columbia, south to Virginia, Nebraska, New Mexico and Nevada. Variable. Odor like Pennyroyal. July–Oct.

36. COLLINSÒNIA L. Sp. Pl. 28. 1753.

Tall perennial aromatic herbs, with large membranous petioled leaves, and terminal loose panicled racemes of small yellowish mostly opposite flowers. Calyx campanulate, short, 10-nerved, 2-lipped, declined in fruit, usually pubescent in the throat; upper lip 3-toothed; lower 2-cleft. Corolla much longer than the calyx, obliquely campanulate, 5-lobed, 4 of the lobes nearly equal, the 5th pendent or declined, fimbriate or lacerate, much larger, appearing like a lower lip. Anther-bearing stamens 2, not declined, much exserted, coiled before anthesis; bases of the filaments connected by a woolly ring; anthers 2-celled, or the sacs at length partially confluent. Ovary deeply 4-parted. Nutlets smooth, globose. [Named for Peter Collinson, 1693–1768, an English botanist, and correspondent of Linnaeus.]

Two or 3 species, natives of eastern North America.

1. Collinsonia Canadénsis L. Horse-balm. Citronella. Rich-weed. (Fig. 3186.)

Collinsonia Canadensis L. Sp. Pl. 28. 1753.

Stem stout, erect or ascending, branched, 2°–5° high, glabrous, or glandular-pubescent above. Leaves ovate or ovate-oblong, acuminate at the apex, narrowed, obtuse or sometimes cordate at the base, the lower slender-petioled, 6′–10′ long, the upper nearly sessile, much smaller, all coarsely dentate; racemes numerous, in terminal panicles sometimes 1° long; pedicels ascending, 3″–6″ long in fruit, subulate-bracteolate at the base; flowers lemon-scented; calyx-teeth subulate, those of the lower lip much longer than those of the upper; corolla light yellow, 5″–7″ long; anther-bearing stamens 2, the upper pair rudimentary; fruiting calyx prominently ribbed, 3″–4″ long.

In moist woods, Maine and Ontario to Wisconsin, south to Florida and Kansas. Root large, thick, woody. Called also Horse-weed and Stone-root. July–Oct.

37. PERÍLLA Ard.; L. Gen. Pl. Ed. 6, Add. 578. 1764.

Annual herbs, with petioled purple or discolored leaves, and small flowers in loose bracted racemes. Calyx campanulate, 10-nerved, 5-cleft, nearly regular in flower, enlarging, declined and becoming 2-lipped in fruit, the upper lip 3-toothed, the lower 2-cleft, the throat not bearded. Corolla-tube not longer than the calyx, the throat obliquely campanulate, the limb 5-cleft, the lower lobe slightly the larger. Stamens 4, nearly equal, or the posterior pair shorter, erect, divergent; anthers 2-celled. Style deeply 2-cleft; ovary 4-parted. Nutlets globose, reticulated. [The native name in India.]

One or 2 species, natives of Asia.

1. Perilla frutéscens (L.) Britton. Perilla. (Fig. 3187.)

Ocimum frutescens L. Sp. Pl. 597. 1753.
Perilla ocimoides L. Gen. Ed. 6, Add. 578. 1764.
Perilla frutescens Britton, Mem. Torr. Club, 5: 277. 1894.

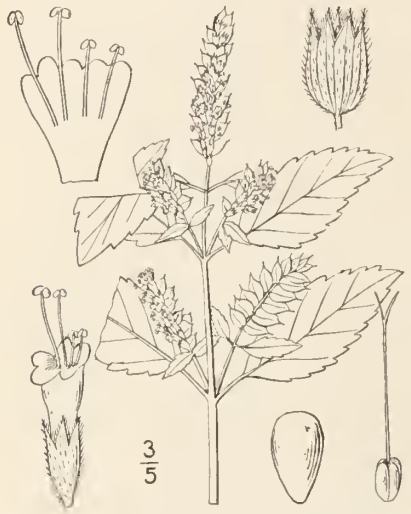
Purple or purple-green, sparingly pubescent; stem stout, erect, much branched, 1°–3° high, leafy. Leaves long-petioled, broadly ovate, acuminate at the apex, narrowed at the base, coarsely dentate, 3′–6′ long and nearly as wide; racemes terminal and axillary, many-flowered, 3′–6′ long; pedicels spreading, 1½″–3″ long in fruit; calyx minute in flower, much enlarged, gibbous at the base and densely pilose-pubescent in fruit; corolla purple or white, 1½″ long, with a woolly ring within.

In waste places, escaped from gardens, southern New York to Illinois. Native of India. July–Oct.

Perilla frutéscens Nankinénsis (Lour.) Britton, Mem. Torr. Club, 5: 277. 1894.
Dentidia Nankinensis Lour. Fl. Cochin. Ed. Willd. 448. 1793.
Perilla ocimoides var. *crispa* Benth. in DC. Prodr. 12: 164. 1848.
Leaves crisped and incised. Escaped from gardens, New Jersey to West Virginia.

38. ELSHÓLTZIA Willd. in Roem. & Ust. Mag. Bot. 11: 3. 1790.

Herbs, with thin mostly petioled leaves, and small or minute clustered flowers, in terminal bracted spikes. Calyx campanulate or ovoid, 10-nerved, scarcely oblique, enlarging in fruit, not bearded in the throat, 5-toothed, the teeth nearly equal. Corolla-tube little longer than the calyx, straight, or a little curved, the limb oblique, or slightly 2-lipped, 4-lobed; upper lobe erect, concave, emarginate, the 3 others spreading. Stamens 4, divergent, didynamous, ascending, exserted, the upper pair shorter; anthers 2-celled, or the sacs more or less confluent. Style 2-cleft at the summit. Ovary 4-parted. Nutlets ovoid or oblong, tuberculate, or nearly smooth. [Named in honor of J. S. Elsholtz, a Prussian botanist.]



About 20 species, natives of Asia.

1. Elsholtzia Patrínii (Lepech.) Kuntze. Elsholtzia. (Fig. 3188.)

Mentha Patrinii Lepech. Nov. Act. Petrop. 13: 336. 1802.
E. cristata Willd. in Roem. & Ust. Mag. Bot. 11: 3. 1790.
Elsholtzia Patrinii Kuntze, Rev. Gen. Pl. 517. 1891.

Annual, glabrous or nearly so; stems weak, erect or ascending, at length widely branched, 1°–2° high. Leaves long-petioled, ovate or obloug, acute or acuminate at the apex, narrowed at the base, crenate-dentate, 1′–3′ long; spikes terminal, very dense, 1′–3′ high, about ½′ thick; flowers several in the axils of each of the broadly ovate membranous green reticulated mucronate bracts; calyx hirsute, shorter than the bract; corolla 1″ long, pale purple.

Notre Dame du Lac, Temiscouata Co., Quebec. Naturalized from Asia. July–Aug.

Family 26. SOLANÀCEAE Pers. Syn. 1: 214. 1805.

POTATO FAMILY.

Herbs, shrubs, vines, or some tropical species trees, with alternate or rarely opposite, exstipulate entire dentate lobed or dissected leaves, and perfect regular or nearly regular cymose flowers. Calyx inferior, gamosepalous, mostly 5-lobed. Corolla gamopetalous, rotate, campanulate, funnelform, salverform or tubular, mostly 5-lobed, the lobes induplicate-valvate or plicate in the bud. Stamens as many as the lobes of the corolla and alternate with them, inserted on the tube, all equal and perfect in the following genera, except in *Petunia*, where 4 are didynamous and the fifth smaller or obsolete; anthers 2-celled, apically or longitudinally dehiscent. Disk present, or none. Ovary entire, superior, 2-celled (rarely 3–5-celled); ovules numerous on the axile placentae, anatropous or amphitropous; style slender, simple; stigma terminal; fruit a berry or capsule. Seeds numerous, the testa sometimes roughened; embryo terete, spiral, curved, or nearly straight; endosperm fleshy; cotyledons semiterete.

About 70 genera and 1600 species, widely distributed, most abundant in tropical regions.

* Fruit a pulpy berry; corolla plicate, its lobes generally induplicate.

Anthers unconnected, destitute of terminal pores, dehiscent.
- Fruiting calyx bladdery-inflated.
  - Fruiting calyx 5-angled and deeply 5-parted; ovary 3–5-celled. 1. *Physalodes.*
  - Fruiting calyx 5-lobed, not parted, 10-ribbed, often 5–10-angled, reticulated, wholly enclosing the berry; ovary 2-celled.
    - Corolla open-campanulate, yellowish or whitish, often with a dark center; seeds with a thin margin, finely pitted. 2. *Physalis.*
    - Corolla flat-rotate, violet or purple: seeds thick, rugose-tuberculate. 3. *Quincula.*
- Fruiting calyx somewhat enlarged, but closely fitted to the fruit, thin, obscurely veiny, open at the mouth.
  - Corolla rotate, whitish; lobes of fruiting calyx much exceeding the berry. 4. *Leucophysalis.*
  - Corolla rotate, whitish, sometimes tinged with purple; fruiting calyx not exceeding the berry. 5. *Chamaesaracha.*

Anthers connivent or slightly connate; fruiting calyx not enlarged.
- Anthers short or oblong, opening by a terminal pore or short slit in our species. 6. *Solanum.*
- Anthers long, tapering from base to summit, longitudinally dehiscent. 7. *Lycopersicon.*

* * Fruit a nearly dry berry; corolla campanulate, little or not at all plicate, its lobes imbricated. 8. *Lycium.*

* * * Fruit a capsule; corolla funnelform.

Capsule circumscissile toward the top, which separates as a lid; corolla irregular. 9. *Hyoscyamus.*
Capsule opening by valves.
Capsule generally prickly. 10. *Datura.*
Capsule not prickly.
Flowers paniculate or racemose; stamens nearly uniform in length. 11. *Nicotiana.*
Flowers solitary; stamens very unequal. 12. *Petunia.*

1. PHYSALÒDES Boehm. in Ludwig, Def. 42. 1760.

[NICANDRA Adans. Fam. Pl. 2: 219. 1763.]

An annual erect branching glabrous herb, with alternate petioled thin sinuate-dentate or lobed leaves, and large light blue peduncled nodding flowers, solitary in the axils. Calyx 5-parted, 5-angled, much inflated in fruit, its segments ovate, connivent, cordate or sagittate at the base, strongly reticulated. Corolla broadly campanulate, plicate in the bud, slightly 5-lobed. Stamens 5, included, inserted on the corolla near its base; filaments filiform, dilated and pilose below; anthers oblong, the sacs longitudinally dehiscent. Ovary 3–5-celled; style slender; stigma 3–5-lobed. Berry globose, nearly dry, enclosed in the calyx. [Greek, Physalis-like.]

A monotypic Peruvian genus.

1. Physalodes physalòdes (L.) Britton. Apple-of-Peru. (Fig. 3189.)

Atropa physalodes L. Sp. Pl. 181. 1753.
Physalodes Peruvianum Kuntze, Rev. Gen. Pl. 452. 1891.
P. physalodes Britton, Mem. Torr. Club, 5: 287. 1894.

Stem angled, 2°–5° high. Leaves ovate or oblong, acuminate but blunt-pointed, narrowed at the base, 3′–8′ long, 1′–4′ wide; petioles longer than the peduncles; flowers 1′–1½′ long and broad; corolla-limb almost entire; fruiting calyx 1′–1½′ long and thick, its segments acute at the apex, their basal auricles acute or cuspidate; berry about ½′ in diameter, loosely surrounded by the calyx.

In waste places, escaped from gardens, Nova Scotia to Ontario, south to Florida. Adventive from Peru. Plant with the aspect of a large *Physalis*. Leaves similar to those of *Stramonium*. July–Sept.

2. PHÝSALIS L. Sp. Pl. 182. 1753.*

Annual or perennial herbs, sometimes a little woody below, with entire or sinuately toothed leaves. Peduncles slender, in ours solitary from the axils of the leaves. Calyx campanulate, 5-toothed, in fruit enlarged and bladdery-inflated, membranous, 5-angled, or prominently 10-ribbed and reticulate, wholly inclosing the pulpy berry, its teeth mostly connivent. Corolla yellowish or whitish, often with a darker brownish or purplish center, open-campanulate, or rarely campanulate-rotate, plicate. Stamens inserted near the base of the corolla; anthers oblong, opening by a longitudinal slit. Style slender, somewhat bent; stigma minutely 2-cleft. Seeds numerous, kidney-shaped, flattened, with a thin edge, finely pitted. [Greek, bladder, referring to the inflated calyx.]

The number of recognized species is about 50. The actual number is, however, much larger. Two species are of European origin, and about half a dozen are natives of India and Australia, the rest are American; 34 occur in the United States.

* Annuals with branched fibrous roots.

† Plants more or less pubescent (except *P. Barbadensis obscura*).

Fruiting calyx sharply 5-angled, more or less acuminate at the summit and sunken at the base; calyx-lobes (at flowering time) lanceolate or acuminate, as long as the tube or longer.
Leaves ovate, oblique, acute or acuminate, subentire at the base; upper part repand or subentire; fruiting calyx small and short; stem slender, diffuse, sharply angled. 1. *P. pubescens.*
Leaves cordate, oblique, strongly sinuate to the base; stem stout, obtusely angled; fruiting calyx rounded. 2. *P. pruinosa.*
Leaves cordate, scarcely oblique, more or less abruptly acuminate, acutely repand dentate; stem tall, acutely angled; fruiting calyx larger, long-acuminate. 3. *P. Barbadensis.*
Fruiting calyx obtusely or indistinctly 5–10-angled; calyx-lobes (at flowering time) triangular, generally shorter than the tube. 4. *P. Lagascae.*

† † Plants glabrous, or the upper part sparingly beset with short hairs, or a little puberulent when young; fruiting calyx obtusely 5–10-angled, not sunken at the base.

Corolla yellow, sometimes with the center a little darker but never brown or purple.
Peduncles generally much longer than the fruiting calyx; leaves sinuately toothed or subentire. 5. *P. lanceifolia.*
Peduncles scarcely exceeding the fruiting calyx; leaves sharply dentate. 6. *P. angulata.*

* Text contributed by Mr. P. A. RYDBERG.

Corolla yellow, with a brown or purple centre.
Peduncles short, scarcely as long as the flowers, which are 5″–8″ in diameter; calyx-lobes broadly triangular. 7. *P. ixocarpa.*
Peduncles longer than the flowers, which are 8″–12″ in diameter; calyx-lobes lanceolate-triangular. 8. *P. Philadelphica.*

* * Perennial by rootstocks.

† Pubescence not stellate (although in *P. pumila* of branched hairs).
Pubescence on the leaves none, on the upper part of the stem and the calyx sparse and short, if any.
Fruiting calyx ovoid, nearly filled by the berry, scarcely sunken at the base.
Leaves ovate-lanceolate to broadly ovate, usually thin. 8. *P. Philadelphica.*
Leaves lanceolate, oblanceolate, or linear. 9. *P. longifolia.*
Fruiting calyx pyramidal, very much inflated and deeply sunken at the base; leaves broadly ovate, usually coarsely dentate. 10. *P. macrophysa.*
Pubescence sparse, consisting of flat, sometimes jointed, and in *P. pumila* branched hairs; in *P. Virginiana* sometimes a little viscid.
Fruiting calyx ovoid, scarcely angled and scarcely sunken at the base; leaves thick, obovate or spatulate to rhomboid, subentire.
Leaves obovate or spatulate; hairs all simple. 11. *P. lanceolata.*
Leaves broader, often rhomboid; hairs on the lower surface branched. 12. *P. pumila.*
Fruiting calyx pyramidal, more or less 5-angled and deeply sunken at the base; leaves ovate to lanceolate, generally more or less dentate. 13. *P. Virginiana.*
Pubescence dense, short, more or less viscid or glandular, often mixed with long flat jointed hairs.
Leaves large; blade generally over 2′ long and more or less cordate. 14. *P. heterophylla.*
Leaves less than 2′ long, rounded ovate or rhombic, scarcely at all cordate at the base; calyx, peduncles and younger branches with long white flat and jointed hairs. 15. *P. comata.*
Leaves small, 1′–1⅔′ in diameter, nearly orbicular, sometimes a little cordate at the base, not coarsely toothed; stem diffuse or prostrate. 16. *P. rotundata.*
† † Pubescence dense, cinereous, beautifully stellate. 17. *P. viscosa.*

1. Physalis pubéscens L. Low Hairy Ground-Cherry. (Fig. 3190.)

Physalis pubescens L. Sp. Pl. 183. 1753.

Stem generally diffuse or spreading, much branched, angled, often a little swollen at the nodes, villous-pubescent or sometimes nearly glabrous; leaves thin, 1′–2½′ long, ovate, acute or acuminate, at the base oblique, slightly cordate and generally entire, upward repand-denticulate or entire, pubescent, sometimes becoming nearly glabrous except along the veins; peduncles short, 1″–2″ long, or in fruit about 5″; calyx-lobes narrow but not with a subulate tip; corolla 3″–5″ in diameter, yellow with dark centre; anthers usually purplish; fruiting calyx membranous, 10″–15″ long, pyramidal, ovoid-acuminate, more or less retuse at the base.

In sandy soil, Pennsylvania to Florida and California; also in Mexico, Central and South America and India. Called also Dwarf Cape Gooseberry and Strawberry Tomato. July–Sept.

2. Physalis pruinòsa L. Tall Hairy Ground-Cherry. (Fig. 3191.)

Physalis pruinosa L. Sp. 184. 1753.
P. pubescens Dunal, in DC. Prod. 13: part 1, 446. 1852. Also American authors in part.

Stout, generally erect, and more hairy than the preceding and the two following species; stem obtusely angled, finely villous or somewhat viscid; leaves firm, 1½′–4′ long, finely pubescent, ovate, cordate, generally very oblique at the base, and deeply sinuately toothed with broad and often obtuse teeth; peduncles 1″–2″ long, in fruit about 5″; calyx villous or viscid; lobes as long as the tube, narrow but not subulate-tipped; corolla 2″–4″ in diameter; anthers yellow, or tinged with purple; fruiting calyx a little firmer and more pubescent than in the preceding, reticulate, 10″–15″ long, ovoid, cordate; berry yellow or green.

In cultivated soil, Massachusetts to Iowa, Missouri and Florida. July–Sept.

3. Physalis Barbadénsis Jacq. Barbadoes Ground-Cherry. (Fig. 3192.)

Physalis Barbadensis Jacq. Misc. 2: 359. 1781.

Stem stouter than in *P. pubescens*, tall and erect or widely spreading, acutely 3-4-angled, pubescent, viscid, or sometimes nearly glabrous; leaves 1½′–2½′ long, ovate or heart-shaped, acute, or abruptly acuminate, sharply repand-dentate, pubescent with short hairs; peduncles short, 1½″–2″ long, but in fruit sometimes 10″; calyx generally densely viscid-hirsute, lobes lanceolate, acuminate, but not subulate-tipped; corolla 2½″–5″ in diameter; anthers generally purplish; fruiting calyx longer than in the two preceding species, 1′–1¼′ long, acuminate and reticulate, retuse at the base.

Sandy soil, North Carolina, southern Illinois and Mexico, the West Indies and South America. July–Sept.

Physalis Barbadénsis obscùra (Michx.) Rydberg, Mem. Torr. Club. 4: 327. 1896.

Physalis obscura Michx. Fl. Bor. Am. 1: 149. 1803.

Greener; perfectly glabrous, or sometimes minutely pubescent, when it grades into *P. Barbadensis* proper. The distribution is about the same as that of the species.

4. Physalis Lagáscae R. & S. Small-flowered Ground-Cherry. (Fig. 3193.)

Physalis Lagascae R. & S. Syst. Veg. 4: 679. 1819.
P. minima Roxb. Fl. Ind. 1: 563. 1820. Not L. 1753.

Stem spreading, often zigzag, branched, striate, or slightly angled, villous with short hairs. Leaves ½′–3½′ long, ovate, oblique and cuneate, obtuse, or cordate at the base, acute but not acuminate, repand or sinuately dentate, hairy, at least on the veins; peduncles ½″–2½″ long, erect, in fruit 2½″–5″ reflexed, shorter than the fruiting calyx; calyx villous, lobes shorter than the tube, triangular; corolla 1½″–4″ in diameter, yellow, generally with a dark centre, anthers generally yellow; fruiting calyx 7″–10″ long, round-ovoid, nearly filled by the berry, scarcely sunken or commonly rounded at the base.

Native of Mexico, the West and East Indies; perhaps only introduced in the United States. Missouri and Kansas to Arkansas and Indian Territory. July–Sept.

5. Physalis lanceifòlia Nees. Lance-leaved Ground-Cherry. (Fig. 3194.)

Physalis lanceifolia Nees, Linnaea, 6: 473. 1831.
P. angulata Ruiz & Pav. Fl. Peruv. 2: 43. 1799. Not L. 1753.

Erect, generally 1½° high, branched; stem angled, glabrous; leaves in the typical form lanceolate, subentire or slightly toothed; calyx cylindrical-campanulate, its lobes broadly triangular, shorter than the tube; peduncles filiform, about 1′ long, erect with nodding flower, in fruit 1¾′–2′ long and reflexed; corolla 3″–4″ in diameter, campanulate, yellow, without a dark spot; anthers yellow, more or less tinged with purple; fruiting calyx about 10″ long, rounded ovoid, indistinctly 10-angled and purple veined, nearly filled by the berry.

Illinois to Texas, California and southward. Also in Mexico and Peru. In the eastern plant the leaves are broader than in the typical form, and sometimes with sharper teeth. July–Sept.

6. Physalis angulàta L. Cut-leaved Ground-Cherry. (Fig. 3195.)

Physalis angulata L. Sp. Pl. 183. 1753.

Erect, 1½°–3° high, glabrous; stem angular; leaves ovate, with more or less cuneate base, somewhat sinuately toothed with long-acuminate teeth; blades 2′–2½′ long, on slender petioles 1′–2′ long, thin, the veins not prominent; peduncles slender, 10″–15″ long, erect, in fruit often reflexed but seldom exceeding the fruiting calyx in length; calyx smooth, lobes triangular to lanceolate, generally shorter than the tube; corolla 2½″–5″ in diameter; anthers more or less purplish tinged; fruiting calyx about 1¼′ long, ovoid, not prominently 5–10-angled, sometimes purple-veined and at last nearly filled by the yellow berry.

In rich soil, North Carolina to Illinois, the Indian Territory, Texas, Central America, Brazil and the West Indies. Also in India. July–Sept.

7. Physalis ixocàrpa Brot. Tomatillo. Mexican Ground-Cherry. Strawberry Tomato. (Fig. 3196.)

Physalis ixocarpa Brot.; Horneman, Hort. Hafn. Suppl. 26. 1819.
P. aequata Jacq. f.; Nees, Linnaea, 6: 470. 1831.

At first erect, later widely spreading, much branched; stem angled, glabrous, or the younger parts sparingly hairy; leaves from cordate to ovate, with a cuneate base which is somewhat oblique, sinuately dentate or entire, 1′–2½′ long; peduncles short, 1″–2½″ long; calyx sparingly hairy, its lobes short, broadly triangular, shorter than the tube; corolla bright yellow with purple throat, 5″–7″ (sometimes nearly 10″) in diameter; fruiting calyx round-ovoid, obscurely 10-angled, often purple-veined, at last often filled by the purple berry, which sometimes bursts it.

Native of Mexico. It is often cultivated for its fruit and frequently escapes from cultivation.

8. Physalis Philadélphica Lam. Philadelphia Ground-Cherry. (Fig. 3197.)

Physalis Philadelphica Lam. Encycl. 2: 101. 1786.

Annual, or perennial from a deep rootstock, tall, erect, 2½°–5° high; stem angled, dichotomously branched, glabrous, or sometimes slightly pubescent with sparse and short hairs on the upper parts; blades ovate to ovate-lanceolate, often very oblique at the base and more or less acuminate, entire or repand-denticulate, 2½′–4′ long, on petioles 1½′–2½′ long, often in pairs; peduncles slender, 5″–10″ long, generally longer than the flower; calyx glabrous, or minutely ciliolate, lobes ovate-lanceolate or triangular, sometimes broadly ovate and unequal, generally equalling the tube; corolla yellow or greenish yellow with purplish throat, ¾′–1′ in diameter; anthers tinged with purple; fruiting calyx at first somewhat 10-angled and sunken at the base, at last often filled with or even burst by the large red or purple berry.

Rhode Island to Georgia, Texas and Nebraska. July–Sept. Formerly cultivated for its fruit.

9. Physalis longifòlia Nutt. Long-leaved Ground-Cherry. (Fig. 3198.)

Physalis longifolia Nutt. Trans. Am. Phil. Soc. (II.) 5: 193. 1833-37.
Physalis lanceolata var. *laevigata* A. Gray, Proc. Am. Acad. 10: 68. 1874.

Perennial from a thick rootstock; stem in the common form stout and tall, 1½°–3° high, slightly angled, branched above, the branches strict, glabrous. Leaves lanceolate, oblanceolate, or linear, tapering into a short stout petiole 5″–10″ long, subentire or repand; peduncles 5″–10″ long, in fruit often recurved; calyx generally glabrous, its lobes triangular-lanceolate, about the length of the tube; corolla 6″–10″ in diameter, yellow with a dark, commonly brownish center; anthers yellow, tinged with purple; fruiting calyx ovoid, about 1¼′ long, not sunken at the base; berry yellow, the lower portion and the stipe glutinous.

In rich soil, Iowa to Arkansas, Utah and Mexico. July-Sept.

10. Physalis macróphysa Rydb. Large-bladder Ground-Cherry. (Fig. 3199.)

P. macrophysa Rydberg, Bull. Torr. Club, 22: 308. 1895.

Perennial; root somewhat thick and fleshy; stem erect, 1½°–3° high, comparatively slender, angled, perfectly glabrous, or the upper parts sparingly pubescent with very short hairs. Leaves large, thin, 1½′–3½′ long, 1′–2′ wide, the lower obtuse, the upper acute or acuminate; petioles slender, 10″–20″ long; peduncles 5″–8″ long, erect, in fruit reflexed; calyx smooth, its lobes ovate-triangular or broadly lanceolate, generally a little shorter than the tube; corolla yellow with a dark center, about 10″ in diameter; anthers generally yellow, sometimes tinged with purple; fruiting calyx large, 1¼′–1½′ long, 1′–1¼′ in diameter, pyramidal to ovoid-conic, indistinctly 10-angled, deeply sunken at the base; berry small, in the center of the calyx.

In rich soil, Texas to Kansas and Arkansas. May–July. Rare.

11. Physalis lanceolàta Michx. Prairie Ground-Cherry. (Fig. 3200.)

Physalis lanceolata Michx. Fl. Bor. Am. 1: 149. 1803.
Physalis Pennsylvanica var. *lanceolata* A. Gray, Man. Ed. 5, 382. 1867.

Perennial; rootstock apparently as a rule slender and creeping; stem about 1½° high, first erect, later spreading or diffuse, only slightly angled, sparingly hirsute with flat hairs. Leaves broadly oblanceolate or spatulate, tapering into the petiole, acute or obtuse, nearly always entire, rarely wavy, but never sinuately toothed, thickish, sparingly hairy with short hairs; peduncles 5″–10″ long, in fruit reflexed; calyx strigose or villous, rarely glabrous, its lobes triangular-lanceolate; corolla dullish yellow with a brownish center, about 8″ in diameter; fruiting calyx round-ovoid, not sunken at the base, indistinctly 10-angled; berry yellow or greenish yellow.

On dry prairies, common west of the Missouri River, extending eastward to Illinois and the Carolinas. July–Sept.

12. Physalis pùmila Nutt. Low Ground-Cherry. (Fig. 3201.)

Physalis pumila Nutt. Trans. Am. Phil. Soc. (II.) 5: 193. 1834.
Physalis lanceolata var. *hirta* A. Gray, Proc. Am. Acad. 10: 68. 1874.

Perennial from a slender rootstock, 1½°–3° high; stem obscurely angled. Leaves thick, broadly ovate to oblong, acute at both ends and somewhat rhomboid, the lower often obtuse and obovate, generally much larger than in the preceding; blades 2′–4′ long, entire or seldom sinuate, on petioles 10″–15″ long, strigose with many-branched hairs especially on the lower surface; peduncles 5″–10″ long, in fruit reflexed and 1½′–2′ long; calyx densely hirsute, not stellate-pubescent, its lobes triangular, generally a little shorter than the tube; corolla yellow with brown center, 8″–10″ in diameter; fruiting calyx usually more elongated than in the preceding, 1½′–2′ long, oblong-ovoid, a little sunken at the base, indistinctly 10-angled.

Plains, Missouri to Colorado and Texas. July–Sept.

13. Physalis Virginiàna Mill. Virginia Ground-Cherry. (Fig. 3202.)

Physalis Virginiana Mill. Gard. Dict. Ed. 8, no. 4. 1768.
Physalis lanceolata Roem. & Sch. Syst. Veg. 4: 673, and American authors mainly. Not Michx. 1803.
Physalis Pennsylvanica A. Gray, Man. Ed. 5, 382. 1867. Not L. 1753.

Perennial; rootstock thick and somewhat fleshy; stem 1½°–3° high, erect, dichotomously branched, somewhat angular, more or less strigose-hairy with flat hairs, sometimes a little glandular, or in some forms nearly glabrous. Leaves ovate-lanceolate, tapering to both ends, 1½′–2½′ long, generally more or less sinuately dentate, often yellowish green; peduncles 5″–10″ long, generally erect, in fruit curved but scarcely reflexed; calyx strigose, hirsute, or at least puberulent, its lobes triangular or broadly lanceolate, nearly equalling the tube; corolla sulphur-yellow with purplish spots, ⅔′–1′ in diameter; anthers yellow; fruiting calyx pyramidal-ovoid, 5-angled, sunken at the base; berry reddish.

Rich soil, especially in open places, New York to Manitoba, Florida and Louisiana. July–Sept. Very variable.

Physalis Virginiàna intermèdia Rydberg, Mem. Torr. Club, 4: 345. 1896.

Leaves very thin and subentire, gradually tapering into winged petioles; pubescence in the young plant somewhat viscid. Perhaps a distinct species. Indiana to Alabama and Texas.

14. Physalis heterophýlla Nees. Clammy Ground-Cherry. (Fig. 3203.)

Physalis viscosa Pursh, Fl. Am. Sept. 157. 1814. Not L. 1753.
Physalis heterophylla Nees, Linnaea, 6: 463. 1831.
Physalis Virginiana A. Gray, Syn. Fl. 2: Part 1, 235. 1878. Not Mill. 1768.

Perennial from a slender creeping rootstock, 1½°–3° tall, at first erect, later generally decumbent and spreading, viscid and glandular, and villous with long spreading jointed flat hairs; leaves large, blade generally over 2′ long, usually broadly cordate, often acute but very rarely with an acumination, thick, more or less sinuately toothed, or sometimes subentire; calyx long-villous, lobes triangular, generally shorter than the tube; corolla 8″–10″ in diameter, greenish yellow with a brownish or purplish center; anthers mostly yellow; berry yellow.

In rich soil, especially where the surface has been disturbed, New Brunswick to Saskatchewan, Florida, Colorado and Texas. The most common of our species, and extremely variable, perhaps includes several distinct species.

Physalis heterophýlla ambigua (A. Gray) Rydberg, Mem. Torr. Club, 4: 349. 1896.

Physalis Virginica var. *ambigua* A. Gray, Proc. Am. Acad. 10: 65. 1874.
Physalis Virginiana var. *ambigua* A. Gray, Syn. Fl. 2: Part 1, 235. 1878.
Physalis ambigua Britton, Mem. Torr. Club, 5: 287. 1895.

Tall and generally upright, very long-villous, scarcely at all viscid; flowers commonly larger; anthers mostly purplish. Vermont to Iowa and Tennessee.

Physalis heterophýlla nyctaginea (Dunal) Rydberg; Chapman, Fl. S. States, Ed. 3, 324. 1897.

Physalis obscura Torr. Fl. N. & M. U. S. 233. 1824. Not Michx. 1803.
Physalis nyctaginea Dunal in DC. Prodr. 13: Part 1, 440. 1852.

Leaves usually dark green and of a firm texture, more or less acuminate at the apex, often sub entire, and pubescent mainly on the veins of the lower surface. Rhode Island to Iowa and Louisiana.

Physalis Peruviàna L., a native of South America, is cultivated for its fruit in all warm and temperate regions, and often escapes. It resembles *P. heterophylla*, but differs in the leaves, which have a long distinct acumination, and in the pubescence, which is shorter, denser, and not at all viscid. Known as Cape Gooseberry, Strawberry Tomato, Peruvian Ground Cherry and Husk Tomato.

15. Physalis comàta Rydberg. Hillside Ground-Cherry. (Fig. 3204.)

Physalis comata Rydberg, Bull. Torr. Club, 22: 306. 1895.

Perennial, erect, about 1½° high; pubescence fine and short, that on the calyx, peduncles and upper branches mixed with long white flat jointed hairs. Like *P. heterophylla* Nees (*P. Virginiana* Gray, not Mill.), but leaves smaller, blade not over 2′ long, round-ovate, scarcely at all cordate at the base, about 2′ long, thin, somewhat repand-dentate, or nearly entire; petioles as long as the leaves; peduncles as long as the fruiting calyx, or longer; corolla greenish yellow, with brown center, 6″–10″ in diameter; fruiting calyx of thin texture, round-ovoid, somewhat 10-angled, scarcely sunken at the base.

Hillsides of Nebraska, Kansas, Colorado and Texas. Rare.

16. Physalis rotundàta Rydberg. Round-leaved Ground-Cherry. (Fig. 3205.)

Physalis hederaefolia Holzinger, Cont. U. S. Nat. Herb. 1: 212. 1892. Not Gray.

Physalis rotundata Rydberg, Mem. Torr. Club, 4: 352. 1896.

Diffuse and spreading, zigzag, generally dichotomously much branched, from a perennial rootstock, densely and finely viscid-pubescent, usually more glandular than the preceding. Leaves nearly orbicular with more or less cordate base, 1′–1⅔′ in diameter, with small teeth; petioles short, more or less winged; peduncles short, in fruit scarcely more than half the length of the calyx; corolla 8″ in diameter, greenish yellow with a brownish center; fruiting calyx ovoid, slightly angled, scarcely sunken at the base.

Dry plains, South Dakota to Texas and New Mexico. July–Sept.

17. Physalis viscòsa L. Stellate Ground-Cherry. (Fig. 3206.)

Physalis viscosa L. Sp. Pl. 183. 1753.

Physalis Pennsylvanica L. Sp. Pl. Ed. 2, 1670. 1763.

Perennial from a slender creeping rootstock; stems slender, creeping, with a dense ashy stellate pubescence, or in age rarely glabrate. Leaves elliptic, oval or ovate, obtuse, thinish, entire or undulate, in the typical South American form often cordate at the base, but rarely so in our plant; peduncles ½′–1′ long; calyx stellate-pubescent, its lobes triangular, generally shorter than the tube; corolla greenish yellow with a darker center, 8″–10″ in diameter; fruiting calyx 10″–15″ long, round-ovoid, scarcely sunken at the base; berry orange or yellow.

On sea beaches, or in sand near the coast, Virginia (?); North Carolina to the Argentine Republic.

Physalis Alkekéngi L., Strawberry Tomato, Winter Cherry, is a native of Europe and Asia, often cultivated for its fruit and sometimes escaped from cultivation. The flowers are whitish, limb more distinctly 5-lobed; leaves broadly deltoid, acute at both ends, repand or angulately toothed.

3. QUÍNCULA Raf. Atl. Journ. 145. 1832.

A low and diffuse somewhat scurfy herb, with a stout perennial root. Leaves from sinuate to pinnatifid, somewhat fleshy. Peduncles most commonly in pairs from the axils of the leaves, sometimes solitary, or in fascicles of 3–5. Calyx campanulate, 5-toothed, in fruit inflated, sharply 5-angular and reticulate, enclosing the fruit, the lobes connivent. Corolla flat-rotate, pentagonal in outline, veiny, violet or purplish. Anthers opening by a longitudinal slit. Seeds comparatively few, kidney-shaped, somewhat flattened, with thick margins, rugose-tuberculate. [Name unexplained.]

A monotypic genus of central North America.

1. Quincula lobàta (Torr.) Raf. Purple-flowered Ground-Cherry. (Fig. 3207.)

Physalis lobata Torr. Ann. Lyc. N. Y. 2: 226. 1827.
Quincula lobata Raf. Atl. Journ. 145. 1832.

Perennial, low, spreading or prostrate, more or less scurfy-puberulent; stem obtusely angled and striate, much branched. Leaves oblanceolate or spatulate to oblong, sinuately toothed, or pinnatifid with rounded lobes, or rarely subentire, cuneate at the base, thickish and veiny, tapering into margined petioles; peduncles 1′–2′ long, in fruit reflexed; calyx-lobes triangular, acute, shorter than the tube; corolla purplish, 10″–15″ in diameter; anthers yellow, tinged with purple; fruiting calyx about as wide as long, sharply 5-angled, sunken at the base.

On high plains, Kansas to California and Mexico. May–Sept.

4. LEUCOPHÝSALIS Rydberg, Mem. Torr. Club, 4: 365. 1896.

A tall erect viscid and villous annual, with entire leaves, the blade decurrent on the petiole. Peduncles generally in fascicles of 2–4 in the axils. Calyx campanulate, 5-lobed, at first a little inflated, but soon filled by and closely fitted to the berry, thin, neither angled nor ribbed, faintly veiny, open at the mouth, the lobes exceeding the fruit. Corolla rotate, white, sometimes tinged with purple and generally creamy or yellow in the center, the limb plicate. Stamens inserted near the base of the corolla; filaments long and slender; anthers oblong, opening by a longitudinal slit. Style and stigma as in *Physalis*. Seeds kidney-shaped, flattened, punctate. [Greek, white *Physalis*.]

A monotypic genus of northern North America.

1. Leucophysalis grandiflòra (Hook.) Rydberg. Large White-flowered Ground-Cherry. (Fig. 3208.)

Physalis grandiflora Hook. Fl. Bor. Am. 2: 90. 1834.
Leucophysalis grandiflora Rydberg, Mem. Torr. Club, 4: 366. 1896.

Erect, tall, 1½°–3° high; stem somewhat angled, striate, more or less villous. Leaves large, 4′–8′ long, ovate to lanceolate-ovate, generally acute and entire, somewhat decurrent on the petiole, more or less villous and viscid, especially on the veins of the lower surface; peduncles several from each axil, short, ⅜′–⅘′ long, villous; calyx villous; lobes lanceolate, equalling the tube; corolla large, 1¼′–1½′ in diameter, rotate, white with a more or less yellowish center; filaments slender; anthers short, yellow, often tinged with purple; fruiting calyx ovoid, early filled by the berry.

Lake Champlain and the St. Lawrence valley to Saskatchewan and Minnesota; according to Gray, "springing up in new clearings." May–July.

5. CHAMAESÁRACHA A. Gray, Bot. Cal. 1: 540. 1876.

Perennials, with entire to pinnatifid leaves, the blade decurrent on the petiole. Peduncles solitary, or in fascicles of 2–4 in the axils. Calyx campanulate, 5 lobed, in fruit somewhat enlarged, but not bladdery-inflated, close-fitting to the berry, thin, not angled nor ribbed, and faintly if at all veiny, open at the mouth, not exceeding the berry. Corolla rotate, white or cream-colored, often tinged with purple, the limb plicate. Stamens inserted near the base of the corolla; filaments long and slender; anthers oblong, opening by longitudinal slits; style and stigma as in *Physalis*. Seeds kidney-shaped, flattened, rugose-favose or punctate. [Ground-*Saracha*, the latter a genus named in honor of Isidore Saracha, a Spanish Benedictine botanist.]

An American genus, consisting of half a dozen species, natives of Mexico and the southwestern United States.

Pubescence dense, puberulent and hirsute. 1. *C. conioides.*
Pubescence sparse, puberulent or stellate, hirsute (if at all) only on the calyx. 2. *C. Coronopus.*

1. Chamaesaracha conioìdes (Moricand) Britton. Hairy Chamaesaracha. (Fig. 3209.)

Solanum conioides Moric.; Dunal in DC. Prodr. 13: Part 1, 64. 1852.
Chamaesaracha sordida A. Gray, Bot. Cal. 1: 540. 1876.
Chamaesaracha conioides Britton, Mem. Torr. Club, 5: 287. 1895.

Much branched from a perennial base, at first upright, at length spreading, cinereous-puberulent with short branched somewhat glutinous or viscid hairs, generally also viscidly hirsute or villous with long and branched hairs, especially on the calyx; leaves oblanceolate to obovate-rhombic, usually acutish and tapering into a short petiole, generally deeply lobed, but varying from subentire to pinnatifid; calyx lobes triangular, generally acutish; corolla about ½′ in diameter, white or ochroleucous, or sometimes violet-purplish; berry 2½″–4″ in diameter.

In dry clayey soil, southern Kansas to California and Mexico. May–Sept.

2. Chamaesaracha Corónopus (Dunal) A. Gray. Smoothish Chamaesaracha. (Fig. 3210.)

Solanum Coronopus Dunal in DC. Prodr. 13: Part 1, 64. 1852.

C. Coronopus A. Gray, Bot. Cal. 1: 540. 1876.

Branched and diffuse from a perennial base; stem obtusely angled; pubescence on the stem and leaves more or less roughish pruinose or stellate, often scarcely any; on the calyx stellate or sometimes hirsute. Leaves linear or lanceolate, tapering at the base, more or less sinuately lobed, occasionally subentire, sometimes pinnatifid; calyx-lobes triangular, acute; corolla white or ochroleucous, the appendages of the throat often protuberant; berry 2½″–4″ in diameter, nearly white.

In clayey soil, Kansas to Utah, California and Mexico. Variable. May–Sept.

6. SOLÀNUM L. Sp. Pl. 184. 1753.

Herbs or shrubs, often stellate-pubescent, sometimes climbing. Flowers cymose, umbelliform, paniculate, or racemose, white, blue, purple, or yellow. Calyx campanulate or rotate, mostly 5-toothed or 5-cleft. Corolla rotate, the limb plaited, 5-angled or 5-lobed, the tube very short. Stamens inserted on the throat of the corolla; filaments short; anthers linear or oblong, acute or acuminate, counate or connivent into a cone, the cells dehiscent by a terminal pore, or sometimes by a short introrse terminal slit, or sometimes also longitudinally. Ovary usually 2-celled; stigma small. Berry mostly globose, the calyx either persistent at its base or enclosing it. [Name, according to Wettstein, from *solamen*, quieting.]

About 900 species, of wide geographic distribution, most abundant in tropical America. Besides the following, some 15 others occur in the southern and western United States.

* Glabrous or pubescent herbs, not prickly.

Plants green; pubescence simple, or some of it stellate; flowers white.
- Leaves repand or entire; ripe berries black. — 1. *S. nigrum.*
- Leaves deeply pinnatifid; ripe berries green. — 2. *S. triflorum.*

Plant silvery stellate-canescent; flowers violet. — 4. *S. elaeagnifolium.*

* * Stellate-pubescent and prickly herbs.

Berry not enclosed by the calyx; perennials.
- Hirsute; leaves ovate or oblong, sinuate or pinnatifid. — 3. *S. Carolinense.*
- Densely silvery-canescent; leaves linear or oblong, repand or entire. — 4. *S. elaeagnifolium.*
- Pubescent; leaves ovate, 5–7-lobed. — 5. *S. Torreyi.*

Berry invested by the spiny calyx; annuals.
- Plant densely stellate-pubescent; corolla yellow. — 6. *S. rostratum.*
- Plant glandular-pubescent, with few stellate hairs; corolla violet. — 7. *S. heterodoxum.*

* * * Climbing vine, not prickly; leaves hastate or 3-lobed. 8. *S. Dulcamara.*

1. Solanum nìgrum L. Black or Garden Nightshade. Morel. (Fig. 3211.)

Solanum nigrum L. Sp. Pl. 186. 1753.

Annual, glabrous, or somewhat pubescent with simple hairs, green; stem erect, branched, 1°–2½° high. Leaves ovate, petioled, more or less inequilateral, 1′–3′ long, entire, undulate, or dentate, thin, acute, acuminate or acutish at the apex, narrowed or rounded at the base; peduncles lateral, umbellately 3–10-flowered, ½′–1½′ long; pedicels 3″–7″ long; flowers white, 4″–5″ broad; calyx-lobes oblong, obtuse, spreading, much shorter than the corolla, persistent at the base of the berry; filaments somewhat pubescent; anthers obtuse; berries black when ripe, smooth and glabrous, globose, 4″–5″ in diameter, on nodding peduncles.

In waste places, commonly in cultivated soil, Nova Scotia to the Northwest Territory, south to Florida and Texas. Widely distributed in nearly all countries as a weed. Called also Duscle, Hound's-berry. July–Oct.

2. Solanum triflòrum Nutt. Cut-leaved Nightshade. (Fig. 3212.)

Solanum triflorum Nutt. Gen. 1: 128. 1818.

Annual, sparingly pubescent with simple hairs, or glabrous; stem branched, 1°–3° high. Leaves pinnatifid, or some of them pinnately lobed, acute at the apex, petioled, 2′–4′ long, the lobes triangular-lanceolate, acute or obtuse, entire or dentate, the sinuses rounded; peduncles lateral, 1–3-flowered, ½′–1′ long; pedicels 3″–7″ long, reflexed in fruit; calyx-segments lanceolate, shorter than the corolla, persistent at the base of the berry; corolla white, 4″–5″ broad; anthers obtuse; berries green when mature, globose, smooth and glabrous, about 5″ in diameter.

On prairies and in waste places, western Ontario to the Northwest Territory, south to Nebraska and Arizona. May–Oct.

3. Solanum Carolinénse L. Horse-Nettle. (Fig. 3213.)

Solanum Carolinense L. Sp. Pl. 184. 1753.

Perennial, green, finely stellate-pubescent with 4–8-rayed hairs; stem erect, branched, 1°–4° high, the branches, petioles, midveins and sometimes the lateral veins of the leaves armed with straight subulate yellow prickles. Leaves oblong or ovate, repand, lobed, or pinnatifid, 2′–6′ long, the lobes obtuse or acutish; petioles 3″–10″ long; flowers cymose-racemose, appearing terminal, but really lateral, as is manifest in fruit; pedicels 3″–7″ long, recurved in fruit; calyx-lobes lanceolate, acuminate, about one-half the length of the corolla, persistent at the base of the berry; corolla-lobes ovate-lanceolate, acute; anthers elongated; berries orange-yellow, smooth and glabrous, 8″–10″ in diameter.

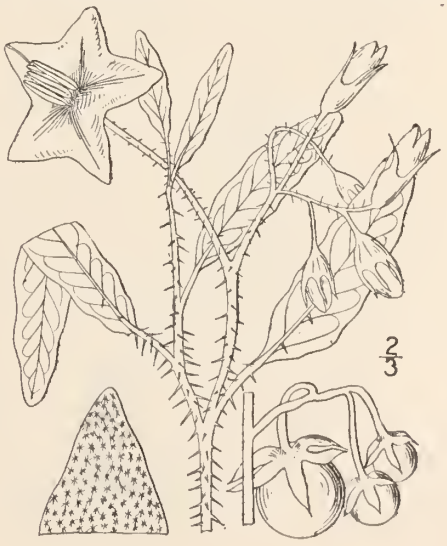
In dry fields and in waste places, southern Ontario to Connecticut and Florida, west to Illinois, Nebraska and Texas. Called also Apple of Sodom. May–Sept.

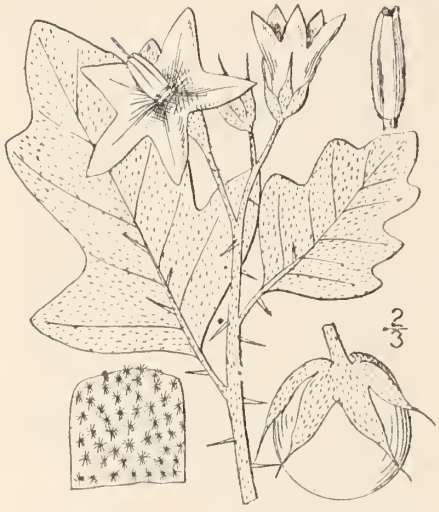
4. Solanum elaeagnifòlium Cav. Silver-leaved Nightshade. (Fig. 3214.)

S. elaeagnifolium Cav. Icon. 3: 22. *pl. 243.* 1794.

Perennial, densely and finely stellate-pubescent, silvery-canescent all over; stem branched, 1°–3° high, armed with very slender sharp prickles, or these wanting. Leaves lanceolate, oblong, or linear, petioled, 1′–4′ long, 3″–12″ wide, mostly obtuse at the apex, narrowed or rounded at the base, repand-dentate or entire; flowers cymose, 8″–12″ broad, violet or blue; peduncles short and stout, appearing terminal, but soon evidently lateral; calyx-lobes lanceolate or linear-lanceolate, acute; anthers linear; ovary white-tomentose; berries globose, yellow or darker, smooth and glabrous, 4″–6″ in diameter.

On dry plains and prairies, Kansas to Texas and Arizona. May–Sept.





5. Solanum Tórreyi A. Gray. Torrey's Nightshade. (Fig. 3215.)

S. Torreyi A. Gray, Proc. Am. Acad. 6: 44. 1862.

Perennial, hoary with a stellate pubescence of 8–12-rayed hairs, more or less armed with small subulate prickles. Leaves ovate in outline, 3′–6′ long, sinuately 5–7-lobed, the lobes entire or undulate, obtuse; cymes appearing terminal, soon evidently lateral, branched, loosely several-flowered; flowers showy, large; calyx-lobes ovate, abruptly long-acuminate, persistent at the base of the berry; corolla violet, 1′–1½′ broad, its lobes ovate, acute; berry globose, smooth and glabrous, 1′ or more in diameter, yellow when ripe.

On dry plains and prairies, Kansas to Texas.

6. Solanum rostràtum Dunal. Sand Bur. Beaked Nightshade. (Fig. 3216.)

Solanum rostratum Dunal, Sol. 234. *pl. 24.* 1813.
Solanum heterandrum Pursh, Fl. Am. Sept. 156. *pl. 7.* 1814.

Annual, densely stellate-pubescent with 5–8-rayed hairs, usually copiously armed with yellow subulate prickles; stem erect, branched, 1°–2½° high. Leaves ovate or oval in outline, irregularly pinnately 5–7-lobed or 1–2-pinnatifid, 2′–5′ long, petioled, the lobes mostly oblong, obtuse; flowers racemose, yellow, about 1′ broad; racemes lateral; pedicels stout, 3″–6″ long, erect both in flower and fruit; calyx densely prickly, surrounding and wholly enclosing the berry, the prickles becoming as long as the fruit, or longer; calyx-lobes lanceolate, acuminate; corolla about 1′ broad, slightly irregular, its lobes ovate, acute; stamens and style declined, the lowest stamen longer with an incurved beak; fruit, including its prickles, 1′ in diameter or more.

On prairies, Nebraska to Texas and Mexico. Occasional in waste places as a weed, Ontario to New Jersey, adventive from the west. May–Sept. The original food of the Colorado beetle or potato-bug.

7. Solanum heterodóxum Dunal. Melon-leaved Nightshade. (Fig. 3217.)

Solanum heterodoxum Dunal, Sol. 235. *pl. 25.* 1813.
Solanum citrullifolium Braun, Ind. Sem. Frib. 1849.

Annual, glandular-pubescent, or a few 4–5-rayed hairs on the leaves, copiously armed with slender yellow subulate prickles, diffusely branched, 1°–3° high. Leaves irregularly bipinnatifid, resembling in outline those of the watermelon, 2′–6′ long; racemes lateral, several-flowered; flowers 1′–1½′ broad, violet; stamens and style declined; lowest anther violet, larger than the four other yellow ones; corolla somewhat irregular, its lobes ovate, acuminate; fruit similar to that of the preceding species.

In dry soil, Kansas (according to Smyth), to Texas, Mexico and New Mexico. July–Sept.

8. Solanum Dulcamàra L. Nightshade. Blue Bindweed. Fellonwort. Bittersweet. (Fig. 3218.)

Solanum Dulcamara L. Sp. Pl. 185. 1753.

Perennial, pubescent with simple hairs or glabrate, stem climbing or straggling, somewhat woody below, branched, 2°–8° long. Leaves petioled, ovate or hastate in outline, 2′–4′ long, 1′–2½′ wide, acute or acuminate at the apex, usually slightly cordate at the base, some of them entire, some with a lobe on one side near the base, some deeply 3-lobed or 3-divided, with the terminal segment much the largest; cymes compound, lateral; pedicels slender, articulated at the base, spreading or drooping; flowers blue, purple, or white, 5″–7″ broad; calyx-lobes short, oblong, obtuse, persistent at the base of the berry; corolla deeply 5-cleft, its lobes triangular-lanceolate, acuminate; berry oval or globose, red.

In waste places or in moist thickets, sometimes appearing as if indigenous, New Brunswick to Minnesota, south to New Jersey, Pennsylvania and Kansas. May–Sept. Old names are Woody Nightshade, Poison-flower, Poison- or Snake-berry. Naturalized from Europe. Native also of Asia.

Solanum triquetrum Cav., a Texan and Mexican nearly glabrous herb, scarcely climbing, with somewhat ridged stems, 3-lobed deltoid-cordate or hastate leaves, lateral few-flowered cymes and globose red berries, is reported from Kansas.

7. LYCOPÉRSICON Mill. Gard. Dict. Ed. 7. 1759.

Annual, or rarely perennial, coarse branching or feebly climbing herbs, with 1–2-pinnately divided leaves, and lateral irregular raceme-like cymes of small yellowish flowers opposite the leaves. Calyx 5-parted, or rarely 6-parted, the segments linear or lanceolate. Corolla rotate, the tube very short, the limb 5-cleft or rarely 6-cleft, plicate. Stamens 5 (rarely 6), inserted on the throat of the corolla; filaments very short; anthers elongated, connate or connivent, introrsely longitudinally dehiscent. Ovary 2–3-celled; style simple; stigma small, capitate. Berry in the wild plants globose or pyriform, much modified in cultivation, the calyx persistent at its base. [Greek, wolf-peach.]

About 4 species, natives of South America.

1. Lycopersicon Lycopérsicon (L.) Karst. Tomato. Love Apple. Cherry Tomato. (Fig. 3219.)

Solanum Lycopersicum L. Sp. Pl. 185. 1753.
L. esculentum Mill. Gard. Dict. Ed. 8. 1768.
Lycopersicum Lycopersicum Karst. Deutsch. Fl. 966. 1880–83.

Viscid-pubescent, much branched, 1°–3° high, the branches spreading. Leaves petioled, pinnately divided, 6′–18′ long, the segments stalked, the larger 7–9, ovate or ovate-lanceolate, mostly acute, dentate, lobed or again divided, 2′–4′ long, with several or numerous smaller, sometimes very small ones interspersed; clusters several-flowered; peduncles 1′–3′ long; flowers 5″–8″ broad; calyx-segments about equalling the corolla; berry the well-known tomato or love-apple.

Escaped from cultivation and occasionally spontaneous from southern New York and Pennsylvania southward. June–Sept.

8. LÝCIUM L. Sp. Pl. 191. 1753.

Shrubs, or woody vines, often spiny, with small alternate entire leaves, commonly with smaller ones fascicled in their axils, and white greenish or purple, axillary or terminal, soli-

tary or clustered flowers. Calyx campanulate, 3–5-lobed or -toothed, not enlarged in fruit, persistent at the base of the berry. Corolla funnelform, salverform, or campanulate, the tube short or slender, the limb 5-lobed (rarely 4-lobed), the lobes obtuse. Stamens 5 (rarely 4), exserted, or included; filaments filiform, sometimes dilated at the base; anther sacs longitudinally dehiscent. Ovary 2-celled; style filiform; stigma capitate or 2-lobed. Berry globose, ovoid, or oblong. [Named from the country Lycia.]

About 75 species, widely distributed in temperate and warm regions. Besides the following, introduced from Europe, some 17 native species occur in the western parts of North America.

1. Lycium vulgàre (Ait. f.) Dunal. Matrimony Vine. Box-thorn. (Fig. 3220.)

Lycium Barbarum var. *vulgare* Ait. f. Hort. Kew. Ed. 2, 2: 3. 1811.

Lycium vulgare Dunal in DC. Prodr. 13: Part 1, 509. 1852.

Glabrous, spiny or unarmed; stems slender, climbing or trailing, branched, 6°–25° long, the branches somewhat angled, the spines, when present, slender, about ½′ long. Leaves lanceolate, oblong, or spatulate, acute or obtuse at the apex, narrowed into short petioles, firm, ½′–1½′ long, 2″–4″ wide; flowers 2–5 together in the axils, or solitary; peduncles filiform, spreading, 6″–12″ long; calyx-lobes ovate, acute, or obtuse, 1½″ long; corolla funnelform, purplish changing to greenish, 4″–6″ broad, its lobes ovate-oblong; stamens slightly exserted; berry oval, orange-red.

In thickets and waste places, escaped from gardens, Ontario to Virginia, west to Minnesota and Kansas. Introduced from Europe. May–Aug.

9. HYOSCYAMUS L. Sp. Pl. 179. 1753.

Erect coarse viscid-pubescent narcotic annual biennial or perennial herbs, with alternate mostly lobed or pinnatifid leaves, and large nearly regular flowers, the lower solitary in the axils, the upper in a more or less 1-sided spike or raceme. Calyx urn-shaped or narrowly campanulate, 5-cleft, striate, enlarged and enclosing the capsule in fruit. Corolla funnelform, the limb somewhat oblique, 5-cleft, the lobes more or less unequal, spreading. Stamens declined, mostly exserted; filaments filiform; anthers oblong or ovate, their sacs longitudinally dehiscent. Ovary 2-celled; style slender; stigma capitate. Capsule 2-celled, circumscissile above the middle. [Greek, hog-bean.]

About 15 species, natives of the Mediterranean region.

1. Hyoscyamus nìger L. Black Henbane. Hog's-bean. (Fig. 3221.)

Hyoscyamus niger L. Sp. Pl. 179. 1753.

Annual or biennial, villous and viscid, of an ill odor; stem stout, 1°–2½° high. Leaves ovate, lanceolate, or oblong in outline, 3′–7′ long, acute or acuminate at the apex, sessile, or the upper clasping the stem, irregularly lobed, cleft or pinnatifid; flowers very short-pedicelled, 1′–2′ broad; calyx-lobes triangular-ovate, acute; corolla greenish-yellow, strongly reticulated with purple veins, its lobes ovate, obtusish; capsule globose-oblong, about 5″ high.

In waste places, Nova Scotia to Ontario, New York and Michigan. Naturalized from Europe. Called also Fetid Nightshade, Insane-root, Belene, Chenile. June–Sept.

10. DATÙRA L. Sp. Pl. 179. 1753.

Annual or perennial erect tall branching narcotic herbs, some tropical species shrubs or trees, with alternate petioled entire sinuate-dentate or lobed leaves, and large solitary erect short-peduncled white purple or violet flowers. Calyx elongated-tubular or prismatic, its apex 5-cleft or spathe-like, in the following species circumscissle near the base which is persistent and subtends the globose ovoid prickly capsule. Corolla funnelform, the limb plaited, 5-lobed, the lobes broad, acuminate. Stamens included or little exserted; filaments filiform, very long, inserted at or below the middle of the corolla-tube. Ovary 2-celled, or falsely 4-celled; style filiform; stigma slightly 2-lobed. Capsule 4-valved from the top, or bursting irregularly. [The Hindoo name, dhatura.]

About 12 species, of wide geographic distribution. The following are introduced weeds.

Glabrous or very sparingly pubescent; leaves lobed, calyx prismatic.	
Stem green; flowers white; lower prickles of the fruit shorter.	1. *D. Stramonium.*
Stem purple; flowers lavender or violet; prickles about equal.	2. *D. Tatula.*
Finely glandular-pubescent; leaves entire; calyx tubular.	3. *D. Metel.*

1. Datura Stramònium L. Stramonium. Jamestown or Jimson-weed. Thorn-Apple. (Fig. 3222.)

Datura Stramonium L. Sp. Pl. 179. 1753.

Annual, glabrous or the young parts sparingly pubescent; stem green, stout, 1°–5° high. Leaves thin, ovate in outline, acute or acuminate at the apex, mostly narrowed at the base, 3′–8′ long, irregularly sinuate-lobed, the lobes acute; petioles 1′–4′ long; flowers white, about 4′ high, the limb 1½′–2′ broad; calyx prismatic, less than one-half the length of the corolla; capsule ovoid, densely prickly, about 2′ high, the lower prickles commonly shorter than the upper.

In fields and waste places, Nova Scotia to Florida, west to Minnesota and Texas. Naturalized from tropical regions, probably from Asia. June–Sept. Called also Fire-weed, and Dewtry.

2. Datura Tátula L. Purple Thorn-Apple. Purple Stramonium. (Fig. 3223.)

Datura Tatula L. Sp. Pl. Ed. 2, 256. 1762.

Similar to the preceding species but usually a little more pubescent; stem commonly more slender, 1°–5° high, purple; leaves almost like those of *D. Stramonium*, but rather darker green or with a tinge of purple; flowers about 4′ high, the limb about 2′ broad, lavender colored or violet, or the tube nearly white; capsule densely prickly, all the longer prickles about equal.

In fields and waste places, Ontario to Minnesota, south to southern New York, Florida and Texas. Naturalized from tropical America. May–Sept.

3. Datura Mètel L. Entire-leaved Thorn-Apple. (Fig. 3224.)

Datura Metel L. Sp. Pl. 179. 1753.

Annual, densely and finely glandular-pubescent; stem stout, much branched, 4°–8° high. Leaves broadly ovate, acute at the apex, inequilateral, rounded or subcordate at the base, 4′–10′ long, entire or merely undulate; petioles 1′–3′ long; flowers white, 6′–7′ high, the limb 3′–4′ broad; calyx tubular, about one-half as long as the corolla; capsule globose or ovoid-globose, obtuse, prickly and pubescent, 1′–1½′ in diameter.

In waste places, escaped from gardens, Rhode Island to Florida. Native of tropical America. July–Sept.

11. NICOTIÀNA L. Sp. Pl. 180. 1753.

Annual or perennial viscid-pubescent acrid narcotic herbs or shrubs, with large alternate entire or slightly undulate leaves, and rather large white yellow greenish or purplish flowers, in terminal, often bracted, racemes or panicles. Calyx tubular-campanulate or ovoid, 5-cleft. Corolla funnelform, salverform, or nearly tubular, the tube usually longer than the limb, 5-lobed, the lobes spreading. Stamens 5, inserted on the tube of the corolla; filaments filiform; anthers ovate or oblong, their sacs longitudinally dehiscent. Ovary 2-celled (rarely 4-celled); style slender; stigma capitate. Capsule 2-valved, or sometimes 4-valved at the summit. Seeds very numerous, small. [Named for John Nicot, French ambassador to Portugal, who sent some species to Catherine de Medici, about 1560.]

About 50 species, mostly natives of America. Besides the following, some 10 others occur in the southern and western United States.

Corolla 1′ long, the tube cylindric; calyx-lobes triangular. 1. *N. rustica.*
Corolla 4′–6′ long, the tube very slender; calyx-lobes linear. 2. *N. longiflora.*

1. Nicotiana rústica L. Wild Tobacco. (Fig. 3225.)

Nicotiana rustica L. Sp. Pl. 180. 1753.

Annual; stem rather slender, 2°–4° high. Leaves broadly ovate, thin, entire, slender-petioled, 2′–8′ long, 1′–6′ wide; petioles ½′–5½′ long; flowers greenish-yellow, about 1′ long, panicled; pedicels 3″–6″ long, rather stout; calyx lobes broadly triangular, acute, shorter than the tube; corolla-tube cylindric, somewhat enlarged above, the lobes short, obtuse, slightly spreading; capsule globose, glabrous, about 5″ in diameter, 2-valved, longer than the calyx.

In fields and waste places, escaped from gardens, Ontario to Minnesota, south to southern New York and Florida. Cultivated by the Indians. Leaves greenish when dry. June–Sept.

2. Nicotiana longiflòra Cav. Long-flowered Tobacco. (Fig. 3226.)

Nicotiana longiflora Cav. Descr. Pl. 106. 1802.

Annual, minutely rough-puberulent and viscid; stem erect, slender, branched, 1½°–3° high. Basal leaves ovate-lanceolate (or broadly oblanceolate), obtuse, 6′–10′ long, 1′–3′ wide, tapering into slender winged petioles; stem leaves linear or lanceolate, sessile, 2′–4′ long; flowers in terminal racemes, short-pedicelled, 4′–6′ long; calyx oblong, pubescent, its narrow lobes nearly as long as the tube; corolla white or purplish, viscid, the tube slender, 1″–1½″ in diameter, expanding above, the lobes ovate-lanceolate, acute; capsule oblong, about equalling the calyx-lobes.

Near Harrisburg and Easton, Pa. Escaped from gardens. Native of South America. Aug.–Oct.

12. PETÙNIA Juss. Ann. Mus. Paris, 2: 215. *pl. 47.* 1803.

Viscid-pubescent annual or perennial branching herbs, with entire leaves, and axillary orterminal solitary white violet or purple flowers (in cultivation sometimes variegated). Calyx deeply 5-cleft or 5-parted, the segments narrow. Corolla funnelform or salverform, the limb plicate, spreading, slightly irregular. Stamens 5, inserted on the throat of the corolla, 4 of them didynamous, perfect, the fifth smaller or obsolete; filaments slender; anthers ovoid, 2-lobed. Disk fleshy. Ovary 2-celled; ovules numerous in each cavity; style filiform; stigma 2-lamellate. Capsule 2-celled, 2-valved, the valves entire. Seeds small, the testa rugose. [*Petun*, an Indian name of tobacco.]

About 12 species, natives of South America.

Corolla white, its tube cylindric. 1. *P. axillaris.*
Corolla violet-purple, its tube campanulate. 2. *P. violacea.*

1. Petunia axillàris (Lam.) B.S.P. White Petunia. (Fig. 3227.)

Nicotiana axillaris Lam. Encycl. 4: 480. 1797.
Petunia nyctaginiflora Juss. Ann. Mus. Paris, 2: 215. *pl. 47. f. 2.* 1803.
Petunia axillaris B.S.P. Prel. Cat. N. Y. 38. 1888.

Very viscid; stem stout, about 1° high. Leaves ovate to obovate, obtuse or blunt-pointed at the apex, sessile, or the lower narrowed into short margined petioles, 3′–4′ long, 1′–2′ wide; peduncles slender, 2′–4′ long, often longer than the leaves; calyx-segments linear-oblong, obtuse; corolla white, its tube cylindric, slightly enlarged above, 1′–1½′ long, 3–4 times as long as the calyx, its limb abruptly spreading, about 2′ broad, the lobes rounded.

In waste places, escaped from gardens, southern New York and Pennsylvania. Native of southern Brazil. July–Sept.

2. Petunia violàcea Lindl. Violet Petunia. (Fig. 3228.)

Petunia violacea Lindl. Bot. Reg. *pl. 1626.* 1833.

Similar to the preceding species, but usually rather lower, and the stem slender. Leaves ovate or obovate, all but the uppermost petioled, mostly obtuse, 1′–2½′ long; peduncles slender, 1′–2′ long; calyx-segments linear, subacute, or obtuse; corolla violet-purple, its tube campanulate, 9″–15″ long, the limb less abruptly spreading, 1′–1½′ broad, the lobes subacute.

In waste places, escaped from gardens, southern New York and Pennsylvania. Native of southern Brazil and Paraguay. June–Sept.

Petunia parviflòra Juss., a prostrate pubescent annual, with small linear to spatulate leaves, and a funnelform corolla 4″–5″ long, is abundant on ballast about the eastern seaports.

Family 27. SCROPHULARIÀCEAE Lindl. Nat. Syst. Ed. 2, 288. 1826.

Figwort Family.

Herbs, shrubs or trees, with opposite or alternate exstipulate leaves, and perfect mostly complete and irregular flowers (corolla wanting in one species of *Synthyris*). Calyx inferior, persistent, 4–5-toothed, -cleft, or -divided, or sometimes split on the lower side, or on both sides, the lobes or segments valvate, imbricate or distinct in the bud. Corolla gamopetalous, the limb 2-lipped, or nearly regular. Stamens 2, 4 or 5, didynamous, or nearly equal, inserted on the corolla and alternate with its lobes; anthers 2-celled, the sacs equal, or unequal, or sometimes confluent into one. Disk present or obsolete. Pistil 1, entire or 2-lobed; ovary superior, 2-celled, or rarely 1-celled; ovules mostly numerous, rarely few, anatropous or amphitropous, borne on axile placentae; style slender, simple; stigma entire, 2-lobed or 2-lamellate. Fruit mostly capsular and septicidally or loculicidally dehiscent. Seeds mostly numerous, the testa reticulated, pitted, striate, ribbed, or nearly smooth; endosperm fleshy; embryo small, straight or slightly curved; cotyledons little broader than the radicle.

About 165 genera and 2500 species, widely distributed, most abundant in temperate regions.

1. Anther-bearing stamens 5; corolla rotate; leaves alternate. 1. *Verbascum.*

2. Anther-bearing stamens 2 or 4; leaves opposite, verticillate or alternate.

* Corolla spurred, saccate or gibbous on the lower side at the base.

Corolla spurred at the base.
- Leaves palmately 3–5-veined. 2. *Cymbalaria.*
- Leaves pinnately veined.
  - Flowers solitary in the axils. 3. *Elatinoides.*
  - Flowers in terminal racemes. 4. *Linaria.*

Corolla saccate or gibbous at the base. 5. *Antirrhinum.*

* * Corolla neither spurred, saccate nor gibbous on the lower side.

† *Anther-bearing stamens 4, the fifth sterile or rudimentary.*

Sterile stamen a scale adnate to the upper side of the corolla. 6. *Scrophularia.*

Sterile stamen elongated, longer or shorter the than others.
- Corolla tubular, 2-lipped, the lobes of the lower lip flat.
  - Sterile stamen shorter than the others; seeds winged. 7. *Chelone.*
  - Sterile stamen about equalling the others; seeds wingless. 8. *Pentstemon.*
- Corolla 2-cleft, declined; middle lobe of the lower lip conduplicate. 9. *Collinsia.*

† † *Stamens 4, all anther-bearing, or 2 sterile, or 2 only.*

a. Stamens 4, all anther-bearing; large Asiatic tree. 10. *Paulownia.*

b. Stamens 4, all anther-bearing; herbs; corolla 2-lipped; stamens not enclosed in upper lip of corolla.

Calyx prismatic, 5-angled, 5-toothed. 11. *Mimulus.*

Calyx 5-parted, not prismatic.
- Calyx-segments equal; leaves pinnatifid in our species. 12. *Conobea.*
- Calyx-segments unequal, the upper one the largest. 13. *Monniera.*

c. Stamens 4, 2 anther-bearing and 2 sterile, or 2 only; corolla obviously 2-lipped.

Calyx 5-parted; upper lip of corolla present.
- Sterile filaments short or none. 14. *Gratiola.*
- Sterile filaments slender, 2-lobed. 15. *Ilysanthes.*

Calyx 4-toothed; upper lip of corolla obsolete; low mud plant. 16. *Micranthemum.*

d. Stamens 4, all anther-bearing; corolla nearly regular; flowers on scapes. 17. *Limosella.*

e. Stamens 2 only; corolla rotate, salverform, tubular, or none.

Leaves alternate; flowers spicate; corolla 2–3-lobed or none. 18. *Wulfenia.*

Leaves, at least the lower, opposite or verticillate; corolla 4-lobed.
- Corolla rotate; capsule obcordate or emarginate, compressed. 19. *Veronica.*
- Corolla tubular-funnelform; capsule ovoid, not compressed. 20. *Leptandra.*

f. Stamens 4, all anther-bearing; corolla campanulate, salverform or funnelform, scarcely 2-lipped.

Leaves alternate; flowers in 1-sided racemes. 21. *Digitalis.*

Leaves, at least the lower, opposite.
- Corolla salverform; flowers in a long spike. 22. *Buchnera.*
- Corolla campanulate or funnelform.
  - Stamens nearly equal; calyx-lobes as long as the tube. 23. *Afzelia.*
  - Stamens strongly didynamous, unequal; calyx-teeth shorter than the tube.
    - Anthers awned at the base; corolla yellow. 24. *Dasystoma.*
    - Anthers awnless; corolla purple, pink or rarely white. 25. *Gerardia.*

g. Stamens 4, all anther-bearing, ascending under the upper lip of the corolla.

Ovules several or numerous; capsule many-seeded.
- Anther-sacs dissimilar, the inner one pendulous by its apex; leaves mostly alternate.
  - Upper lip of the corolla much longer than the lower. 26. *Castilleja.*
  - Upper lip of the corolla scarcely longer than the lower. 27. *Orthocarpus.*
- Anther-sacs similar and parallel; leaves mostly opposite.
  - Calyx 2-bracteolate at the base, 5-toothed. 28. *Schwalbea.*
  - Calyx not bracteolate, 4–5-toothed, or cleft or split.
    - Upper lip of the corolla 2-lobed, its margins recurved; calyx 4-cleft. 29. *Euphrasia.*
    - Margins of the upper lip of the corolla not recurved.
      - Calyx scarcely or not at all inflated in fruit; galea entire.
        - Calyx 4-toothed or 4-cleft; capsule straight.
          - Seeds spreading, numerous. 30. *Bartsia.*

Seeds pendulous, few. 31. *Odontites.*
Calyx split on the lower side or on both sides; capsule oblique. 32. *Pedicularis.*
Calyx ovoid, much inflated and veiny in fruit. 33. *Rhinanthus.*
Ovules only 1 or 2 in each cell of the ovary; capsule 1-4-seeded; leaves opposite. 34. *Melampyrum.*

1. VERBÁSCUM L. Sp. Pl. 177. 1753.

Biennial or rarely perennial, mostly tall and erect herbs, with alternate dentate pinnatifid or entire leaves, and rather large yellow purple red or white flowers, in terminal spikes, racemes or panicles. Calyx deeply 5-cleft or 5-parted. Corolla flat-rotate or slightly concave, 5-lobed, the lobes a little unequal, the upper exterior, at least in the bud. Stamens 5, inserted on the base of the corolla, unequal, all anther-bearing; filaments of the 3 upper stamens, or of all 5, pilose; anther-sacs confluent into one. Ovules numerous; style dilated and flattened at the summit. Capsule globose to oblong, septicidally 2-valved, many-seeded, the valves usually 2-cleft at the apex. Seeds rugose, not winged. [The Latin name of the great mullen; used by Pliny.]

About 125 species, natives of the Old World. Besides the following, another is naturalized in the western United States.

Plants densely woolly; flowers in dense terminal spikes, or spike-like racemes.
Leaves strongly decurrent on the stem. 1. *V. Thapsus.*
Leaves not decurrent, or but slightly so. 2. *V. phlomoides.*
Leaves white-tomentose beneath; flowers in large terminal panicles. 3. *V. Lychnitis.*
Plant glabrous or sparingly glandular; flowers racemose. 4. *V. Blattaria.*

1. Verbascum Thápsus L. Great Mullen. Velvet or Mullen Dock. (Fig. 3229.)

Verbascum Thapsus L. Sp. Pl. 177. 1753.

Erect, stout, simple or with some erect branches, densely woolly all over with branched hairs; stem 2°–7° high, wing-angled by the bases of the decurrent leaves. Leaves oblong, thick, acute, narrowed at the base, dentate or denticulate, 4′–12′ long, the basal ones borne on margined petioles; flowers yellow, 8″–12″ broad, sessile, numerous in dense elongated spikes rarely branched above; stamens unequal, the three upper shorter with white hairy filaments and short anthers, the two lower glabrous or nearly so with larger anthers; capsule about 3″ high, slightly longer than the woolly calyx.

In fields and waste places, Nova Scotia to Minnesota, Florida and Kansas. Often a troublesome weed. Naturalized from Europe. Native also of Asia. Among some 40 English names are Hedge-, Hig- or High-taper, Candlewick, Cow's Lungwort, Aaron's-rod or -flannel, Feltwort, Hare's-beard, Jacob's-, Jupiter's- or Peter's-staff, Ice-leaf, Torches, Flannel- or Blanket-leaf, Woolen, *i. e.*, Mullen. June–Sept.

2. Verbascum phlomoides L. Clasping-leaved Mullen. (Fig. 3230.)

Verbascum phlomoides L. Sp. Pl. 1194. 1753.

Stem rather stout, usually simple, 1°–4° high. Leaves oblong to ovate-lanceolate, crenate, crenulate, or entire, woolly-tomentose on both sides, sessile or somewhat clasping, or slightly decurrent on the stem, or the lower often petioled with truncate or subcordate bases; flowers yellow, or cream-color, 1′ broad or more, usually in a solitary elongated tomentose spike-like raceme; pedicels clustered, shorter than the calyx; stamens as in *V. Thapsus;* capsule 4″–5″ long, exceeding the tomentose calyx.

Eastern Massachusetts. Adventive or fugitive from Europe or eastern Asia. June–Aug.

3. Verbascum Lychnìtis L. White Mullen. (Fig. 3231.)

Verbascum Lychnitis L. Sp. Pl. 177. 1753.

Stem angled, rather stout, paniculately branched above, 2°–4½° high, densely covered, as well as the lower surfaces of the leaves, with a white canescent nearly stellate pubescence. Leaves oblong, ovate or oblong-lanceolate, crenate-dentate, 2′–7′ long, the upper acute, sessile, but not decurrent on the stem, the lower obtuse or acute at the apex and narrowed into margined petioles; flowers in a large terminal panicle, racemose on its branches, white or cream-color, 5″–6″ broad, nearly sessile; pilose hairs of the 3 shorter filaments white; capsule about 2″ high, equalling or exceeding the calyx.

In fields and waste places, Ontario to New Jersey and Pennsylvania. Reported from Kansas. Naturalized from Europe. Native also of Asia. June–Sept. Its down once used for lighting, hence *Lichnitis*, lamp.

4. Verbascum Blattària L. Moth Mullen. (Fig. 3232.)

Verbascum Blattaria L. Sp. Pl. 178. 1753.

Stem erect, strict, slender, terete, glabrous or sparingly glandular-pubescent, usually quite simple, 2°–6° high. Leaves oblong, ovate or lanceolate, dentate, laciniate, or pinnatifid, acute or acuminate, the upper ½′–2½′ long, truncate or cordate-clasping at the base, the lower and basal ones sessile or somewhat petioled, sometimes 1° long, seldom present at flowering time; raceme 1°–2° long, loose; pedicels spreading, ½′–1′ long, bracted at the base; corolla yellow or white, about 1′ broad, with brown marks on the back; filaments all pilose with violet hairs; capsule depressed-globose, 3″ in diameter, longer than the calyx.

In fields and waste places, Quebec to Florida, west to Minnesota and Kansas. Naturalized from Europe. Native also of Asia. June–Nov. Said to repel the cockroach (*Blatta*), whence the name *Blattaria*; frequented by moths, hence Moth Mullen.

2. CYMBALÀRIA Medic. Phil. Bot. 2: 70. 1791.

Perennial creeping or spreading herbs, with long-petioled, mostly lobed, palmately veined leaves, and solitary axillary white to violet flowers. Calyx 5-parted. Corolla irregular, 2-lipped, short-spurred; upper lip 2-lobed, lower lip 3-lobed; throat nearly or quite closed by the palate. Stamens 4, didynamous, ascending, included, the filaments filiform. Style very slender. Capsule dehiscent by 2 terminal 3-toothed pores. Seeds numerous, small. [From the Greek for cymbal.]

About 9 species, natives of the Old World.

1. Cymbalaria Cymbalària (L.) Wettst. Kenilworth or Coliseum Ivy. (Fig. 2333.)

Antirrhinum Cymbalaria L. Sp. Pl. 612. 1753.
Linaria Cymbalaria Mill. Gard. Dict. Ed. 8, no. 17. 1768.
Cymbalaria Cymbalaria Wettst. in Engl. & Prantl. Nat. Pfl. Fam. 4: Abt. 3b, 58. 1891.

Perennial, glabrous; stem trailing, branched, often rooting at the nodes, 3′–12′ long. Leaves slender-petioled, reniform-orbicular, palmately 3–5-veined, 3–5-lobed, ¼′–1′ in diameter, the lobes broad and obtuse; petioles usually as long as the blade; flowers axillary, solitary, blue or lilac, 4″–5″ long; peduncles slender, recurved, shorter than the petioles; calyx-segments lanceolate, acute; palate yellowish; capsule globose, several-seeded; seeds rugose, wingless.

Waste places and roadsides, adventive from Europe, New York, New Jersey and Pennsylvania, and in seaport ballast. Other English names are Ivy-leaved Toadflax, Ivy-weed, Climbing or Roving Sailor, Aaron's-beard, Wandering Jew, Mother-of-thousands, Oxford-weed, Pennywort. June–Aug.

3. ELATINOÌDES Wettst. in Engl. & Prantl, Nat. Pfl. Fam. 4: Abt. 3b, 58. 1891.

[ELATINE Moench, Meth. 524. 1794. Not L. 1753.]

Mostly annual spreading or creeping herbs, with pinnately veined, short-petioled entire toothed or lobed leaves, and solitary axillary white yellow or variegated flowers. Calyx 5-parted. Corolla irregular, spurred, 2-lipped, the throat closed by the palate. Stamens 4, didynamous, included; filaments filiform. Capsule subglobose, or ovoid, opening by 1 or 2 terminal slits, pores, or valves. Seeds numerous, ovoid, mostly rough or tubercled. [Greek, resembling *Elatine*.]

About 25 species, natives of the Old World.

Leaves ovate-orbicular, cordate or rounded at the base. 1. *E. spuria.*
Leaves hastate. 2. *E. Elatine.*

1. Elatinoides spùria (L.) Wettst. Round-leaved Toad-Flax. (Fig. 3234.)

Antirrhinum spurium L. Sp. Pl. 613. 1753.
Linaria spuria Mill. Gard. Dict. Ed. 8, no. 15. 1768.
Elatinoides spuria Wettst. in Engl. & Prantl, Nat. Pfl. Fam. 4: Abt. 3b. 58. 1891.

Annual, pubescent all over; stems prostrate, branched or simple, 3′–2° long. Leaves short-petioled, ovate-orbicular, entire, or sometimes dentate, mucronulate at the apex, cordate or rounded at the base, ¼′–1′ in diameter; petioles 1″–2″ long; flowers solitary in the axils, small; peduncles filiform, very pubescent, often much longer than the leaves; calyx-segments ovate, acute at the apex, cordate or rounded at the base, one-half as long as the corolla; corolla yellowish with a purple upper lip, the spur curved, about as long as the tube; capsule subglobose, shorter than the calyx; seeds rugose, not winged.

In waste places and ballast, southern New York to North Carolina. Adventive from Europe. This and the next called also Cancerwort and Female Fluellin. June–Sept.

2. Elatinoides Elatìne (L.) Wettst. Sharp-pointed Fluellin or Toad-Flax. (Fig. 3235.)

Antirrhinum Elatine L. Sp. Pl. 612. 1753.
Linaria Elatina Mill. Gard. Dict. Ed. 8, no. 16. 1768.
Elatinoides Elatine Wettst. in Engl. & Prantl, Nat. Pfl. Fam. 4: Abt. 3b. 58. 1891.

Annual, pubescent; stems prostrate, usually branched, slender, 6′–2° long. Leaves short-petioled, ovate, ½′–1′ long, acute or acutish at the apex, triangular, hastate, truncate, or subcordate at the base, the basal auricles divergent, acute; petioles 1″–3″ long; flowers solitary in the axils, about 3″ long; peduncles filiform, glabrous, or somewhat hairy, usually longer than the leaves; calyx-segments narrowly lanceolate, acute; corolla yellowish, purplish beneath, its spur slender, straight, declined; capsule subglobose, shorter than the calyx; seeds wingless.

In sandy waste places, Canada; New York to North Carolina. Naturalized from Europe. Native also of Asia. Called also Canker-root. June–Sept.

4. LINÀRIA Juss. Gen. Pl. 120. 1789.

Herbs, some exotic species shrubby, with alternate entire dentate or lobed leaves, or the lower and those of sterile shoots opposite or verticillate, and yellow white blue purple or variegated flowers, in terminal bracted racemes or spikes. Calyx 5-parted, the segments imbricated. Corolla irregular, spurred at the base, or the spur rarely obsolete, 2-lipped, the upper lip erect, 2-lobed, covering the lower in the bud, the lower spreading, 3-lobed, its base produced into a palate often nearly closing the throat. Stamens 4, didynamous, ascending, included; filaments and style filiform. Capsule ovoid or globose, opening by 1 or more mostly 3-toothed pores or slits below the summit. Seeds numerous, wingless or winged, angled or rugose. [Latin, *linum*, flax, which some species resemble.]

About 150 species, of wide geographic distribution, most abundant in the Old World. Besides the following, another occurs in southern Florida. The corolla, especially the terminal one of the raceme, occasionally has 5 spurs and is regularly 5-lobed, and is then said to be in the Peloria state.

Flowers yellow, 8″–15″ long.
Leaves linear; flowers 12″–15″ long; seeds winged. 1. *L. Linaria.*
Leaves lanceolate; flowers 8″–10″ long; seeds wingless. 2. *L. genistaefolia.*
Flowers blue to white, 3″–6″ long.
Spur of corolla filiform, curved; native species. 3. *L. Canadensis.*
Spur of corolla short, conic; European adventive species. 4. *L. repens.*

1. Linaria Linària (L.) Karst. Ranstead. Butter-and-Eggs. Yellow Toad-Flax. (Fig. 3236.)

Antirrhinum Linaria L. Sp. Pl. 616. 1753.
Linaria vulgaris Mill. Gard. Dict. Ed. 8. no. 1. 1768.
Linaria Linaria Karst. Deutsch. Fl. 947. 1880–83.

Perennial by short rootstocks, pale green and slightly glaucous; stems slender, erect, very leafy, glabrous, or sparingly glandular-pubescent above, simple or with few erect branches, 1°–3° high. Leaves linear, sessile, entire, acute at both ends, mostly alternate, ½′–1½′ long, 1″–1½″ wide; flowers densely racemose, light yellow, 1′–1¼′ long, the spur of the erect corolla somewhat darker, the palate orange-colored; pedicels 2″–4″ long, nearly erect; calyx-segments oblong, acutish, about 1½″ long; spur subulate, nearly as long as the body of the corolla; middle lobe of the lower lip shorter than the other two; capsule ovoid, the seeds rugose, winged.

In fields and waste places, Nova Scotia to Manitoba, south to Virginia and Nebraska. Naturalized from Europe. Native also of Asia. June–Oct. Called also Brideweed, Flaxweed, and Eggs and Bacon. Widely distributed in temperate regions as a weed.

2. Linaria genistaefòlia (L.) Mill. Broom-leaved Toad-Flax. (Fig. 3237.)

Antirrhinum genistaefolium L. Sp. Pl. 616. 1753.
Linaria genistaefolia Mill. Gard. Dict. Ed. 8, no. 14. 1768.

Similar to the preceding species but more glaucous and usually paniculately branched; stem rather stout, 1°–3° high; leaves lanceolate, sessile, 1′–3½′ long, 2″–6″ wide, acute or acuminate at the apex; flowers yellow, loosely racemose, 8″–10″ long; pedicels short; spur of the corolla nearly as long as the tube; capsule ovoid; seeds wingless.

Sparingly established on the northern part of New York Island; station now nearly or quite obliterated. Naturalized or adventive from continental Europe. June-Aug.

3. Linaria Canadénsis (L.) Dumont. Blue or Wild Toad-Flax. (Fig. 3238.)

Antirrhinum Canadense L. Sp. Pl. 618. 1753.
Linaria Canadensis Dumont, Bot. Cult. 2: 96. 1802.

Biennial or annual, glabrous, green, sometimes fleshy; flowering stems erect or ascending, very slender, simple, or branched, 4′–2½° high, the sterile shoots spreading or procumbent, very leafy. Leaves linear or linear-oblong, 4″–15″ long, ½″–1″ wide, entire, sessile, those of the sterile shoots, or some of them, usually opposite; flowers 3″–4″ long, in slender long racemes; pedicels 2″–3″ long, erect and appressed in fruit, minutely bracted at the base; calyx-segments lanceolate, acute, or acuminate, about as long as the capsule; spur of the corolla filiform, curved, as long as the tube or longer; palate a white convex 2-ridged projection; capsule opening by 2 apical valves, each valve becoming 3-toothed; seeds angled, wingless.

In dry soil, Nova Scotia to Florida, west to Minnesota, Oregon, Texas and California. Also in Central and South America. A dwarf form with no corolla is frequent. May-Sept.

4. Linaria rèpens (L.) Mill. Pale-blue Toad-Flax. (Fig. 3239.)

Antirrhinum repens L. Sp. Pl. 614. 1753.
Linaria repens Mill. Gard. Dict. Ed. 8. no. 6. 1768.
Linaria striata DC. Fl. France, 3: 586. 1805.

Glabrous, perennial by a horizontal or creeping rootstock; stem erect, or the base decumbent, 8′–30′ high, usually branched, the branches slender. Leaves linear, entire, short-petioled or sessile, ½′–2′ long, 1″–2″ wide, narrowed to both ends, the lower crowded, sometimes whorled, the upper more scattered; flowers in slender terminal elongating racemes; pedicels 2″–5″ long; bracts narrowly linear, acute; corolla nearly white, but striped with blue or purple, about 6″ long; spur short, conic; capsule subglobose; seeds wrinkled, wingless.

Newfoundland, and in ballast about the Atlantic seaports. Adventive from Europe. Summer.

5. ANTIRRHÌNUM L. Sp. Pl. 612. 1753.

Annual or perennial herbs, with alternate leaves, or the lower and those of sterile shoots opposite, and mostly large red purple yellow or white flowers, in terminal racemes, or solitary in the upper axils. Calyx 5-parted, the segments imbricated. Corolla irregular, gibbous, or saccate, but not spurred at the base, 2-lipped, the upper lip erect, 2-lobed, the lower spreading, 3-lobed, its base produced into a palate nearly or quite closing the throat. Stamens 4, didynamous, included; filaments filiform, or dilated at the summit. Style filiform. Capsule ovoid or globose, opening by chinks or pores below the summit. Seeds numerous, oblong, truncate, rugose or smooth, not winged. [Greek, nose-like.]

About 40 species, natives of Europe, Asia and western North America. Besides the following introduced species, some 18 others inhabit the western United States.

Flowers 1′–1½′ long; calyx-segments ovate, much shorter than the corolla. 1. *A. majus.*
Flowers 5″–7″ long; calyx-segments linear, as long as the corolla. 2. *A. Orontium.*

1. Antirrhinum màjus L. Great Snapdragon. Lion's-mouth. (Fig. 3240.)

Antirrhinum majus L. Sp. Pl. 617. 1753.

Perennial, glabrous below, usually more or less glandular-pubescent above; stem branched or simple, 1°–3° high. Leaves lanceolate, linear or oblong-lanceolate, entire, short-petioled, acute at both ends, rather firm, glabrous, 1′–3′ long, 1″–5″ wide; flowers racemose, purplish-red (of a variety of colors in cultivated forms), 1′–1½′ long; pedicels rather stout, 3″–6″ long, erect in fruit; calyx-segments oval to ovate, obtuse, 2″–3″ long; capsule obliquely ovoid, 4″–5″ high, opening by 2 pores just below the summit or at length apically 2-valved, much longer than the calyx.

In waste places, sparingly escaped from gardens in the Atlantic States. Adventive from Europe. Other English names are Rabbit's Mouth, Bonny Rabbits, Calf-snout, Dragon's- Tiger's- Dog's- or Toad's-mouth, Bulldogs. June–Sept.

2. Antirrhinum Orόntium L.
Lesser Snapdragon. (Fig. 3241.)

Antirrhinum Orontium L. Sp. Pl. 617. 1753.

Annual, glabrous or pubescent; stem erect, simple, or branched, slender, about 1° high. Leaves narrowly linear, or the lower linear-spatulate, almost sessile, narrowed at both ends, 1′–2′ long, 1″–2″ wide; flowers solitary in the upper axils, purple, mostly distant, 5″–7″ long; peduncles shorter than the flowers; calyx-segments linear, somewhat unequal, as long as the corolla, elongated in fruit so as much to exceed the pubescent capsule.

In fields and waste places, New England and New York. Also on Vancouver Island. Adventive from Europe. Native also of Asia. June–Aug.

6. SCROPHULÀRIA L. Sp. Pl. 619. 1753.

Perennial strong-smelling herbs, some exotic species shrubby, with mostly opposite large leaves, and small purple greenish or yellow proterogynous flowers, in terminal panicled cymes or thyrses. Calyx 5-parted or 5-cleft, the segments or lobes mostly obtuse. Corolla irregular, the tube globose to oblong, not gibbous nor spurred at the base, the limb 5-lobed, the 2 upper lobes longer, erect, the lateral ones ascending, the lower spreading or reflexed. Stamens 5, 4 of them anther-bearing and didynamous, declined, mostly included, their anther-sacs confluent into one, the fifth sterile, reduced to a scale on the roof of the corolla tube. Style filiform; stigma capitate or truncate. Capsule ovoid, septicidally dehiscent. Seeds rugose, not winged. [Named for its repute as a remedy for scrofula.]

About 120 species, natives of the northern hemisphere, most abundant in southern Europe. Besides the following, 2 or 3 others occur in the western United States.

Corolla dull outside; sterile stamen deep purple. 1. *S. Marylandica.*
Corolla shining outside; sterile stamen greenish yellow. 2. *S. leporella.*

1. Scrophularia Marylándica L. Maryland Figwort, Heal-all or Pilewort. (Fig. 3242.)

Scrophularia Marylandica L. Sp. Pl. 619. 1753.
Scrophularia nodosa var. *Marylandica* A. Gray, Syn. Fl. 2: Part 1, 258. 1878.

Glabrous below, somewhat glandular-pubescent above; stem slender, 4-angled with grooved sides, usually widely branched, erect, 3°–10° high. Leaves membranous, slender-petioled, usually puberulent beneath, ovate or ovate-lanceolate, acuminate at the apex, sharply serrate, narrowed, truncate or subcordate at the base, 3′–12′ long; flowers greenish-purple, 3″–4″ long, very numerous in the nearly leafless thyrses; bractlets mostly opposite, pedicels slender, ascending, 4″–12″ long; calyx-lobes broadly ovate, obtuse, about the length of the tube; corolla green, dull without, brownish purple and shining within, little contracted at the throat, the two lateral lobes slightly spreading, the upper lip erect, its lobes short, rounded; capsule subglobose, with a slender tip; sterile stamen deep purple.

In woods and thickets, New York to Kansas, North Carolina and Tennessee. Ascends to 4000 ft. in North Carolina. The ranges of this and the following species are not yet definitely determined. July–Sept.

2. Scrophularia leporélla Bicknell. Hare Figwort. (Fig. 3243.)

Scrophularia leporella Bicknell, Bull. Torr. Club, 23: 317. 1896.

Stem puberulent below, viscid-glandular above, sharply 4-angled with flat sides, 3°–8° tall, simple, or somewhat branched. Leaves short-petioled, ovate to lanceolate, acuminate at the apex, mostly narrowed at the base, but sometimes subcordate, glabrous on both sides when mature, usually incised-dentate, 2′–10′ long; flowers 4″–5″ long, in elongated narrow thyrses; bractlets mostly alternate; calyx-lobes ovate, obtuse, or acute; corolla contracted at the throat, green to purple and shining without, dull within, the two lateral lobes erect; lobes of the upper lip often narrowly oblong; sterile stamen greenish yellow; capsule ovoid-conic.

In woods and along roadsides, Connecticut to Minnesota, Virginia and Nebraska. Ascends to 3500 ft. in Virginia. May–July.

7. CHELÒNE L. Sp. Pl. 611. 1753.

Perennial, mostly glabrous branched or simple herbs, with opposite serrate petioled leaves, and large white red or purple flowers, in terminal and axillary dense spikes. Calyx 5-parted, bracted at the base, the segments ovate or lanceolate. Corolla irregular, the tube elongated, enlarged above, the limb 2-lipped; upper lip concave, emarginate or entire, exterior in the bud; lower lip spreading, woolly within, 3-lobed, its lateral lobes sometimes longer than the middle one. Stamens 5, included, 4 of them antheriferous, didynamous, the fifth sterile, smaller; filaments slender, woolly; anthers woolly, cordate. Style filiform; stigma small, capitate. Capsule ovoid, septicidally dehiscent. Seeds numerous, compressed, winged. [Greek, tortoise, the head of which the corolla resembles.]

Three species, natives of eastern North America.

Corolla white; bracts not ciliolate. 1. *C. glabra.*
Corolla red or rose-purple; bracts ciliolate.
  Leaves oblong or lanceolate. 2. *C. obliqua.*
  Leaves ovate, acuminate; mountain plant. 3. *C. Lyoni.*

1. Chelone glàbra L. Snake-head. Turtle-head. (Fig. 3244.)

Chelone glabra L. Sp. Pl. 611. 1753.

Stem slender, erect, obtusely 4-sided, simple or sometimes branched, strict, 1°–3° high, the branches erect. Leaves lanceolate, sharply serrate with low appressed teeth, acuminate at the apex, narrowed at the base, short-petioled, 3′–6′ long, ½′–1¼′ wide, the principal veins about 10 on each side of the midvein; flowers white or faintly pink, about 1′ long; bracts glabrous, not ciliolate; calyx-segments ovate-oblong, obtuse; capsule ovoid, obtuse, about ½′ high, twice as long as the calyx.

In swamps and along streams, Newfoundland to Florida, west to Manitoba and Kansas. Ascends to 3000 ft. in the Adirondacks. Called also Shell-flower, Cod-head, Bitter-herb and Balmony. Lower leaves sometimes broadly oval. July–Sept.

2. Chelone obliqua L. Red Turtle-head. (Fig. 3245.)

Chelone obliqua L. Syst. Ed. 11, no. 4. 1767.

Stem slender, ascending, 1°–2° high, usually branched, the branches spreading or ascending. Leaves oblong, or broadly lanceolate, acuminate at the apex, narrowed at the base, petioled, sharply serrate with somewhat spreading teeth, or laciniate, 2′–6′ long, ½′–2½′ wide; petioles 2″–6″ long; principal veins about 10 on each side; flowers red or rose-purple, about 1′ long; bracts and calyx-segments ciliolate and usually puberulent; capsule similar to that of the preceding species.

In wet thickets and along streams, Virginia to Illinois, south to Florida. July–Sept.

3. Chelone Lyoni Pursh. Lyon's Turtle-head. (Fig. 3246.)

Chelone Lyoni Pursh, Fl. Am. Sept. 737. 1814.

Stem slender, erect or nearly so, simple or branched, 1°–3° high. Leaves ovate, acuminate at the apex, rounded, truncate or subcordate at the base; 3′–7′ long, 1′–4′ wide, usually slender-petioled, sharply serrate with divergent teeth, the principal veins 8–10 on each side; flowers red or rose-purple, about 1′ long; bracts and calyx-segments ciliolate and puberulent.

In swamps and wet thickets, mountains of Virginia (?); North Carolina and Tennessee to Georgia. July–Sept.

8. PENTSTÈMON Soland. in Ait. Hort. Kew. 3: 511. 1789.

Perennial herbs, mostly branched from the base only, with opposite or rarely verticillate leaves, or the upper occasionally alternate, and large, usually showy, blue purple red or white flowers, in terminal thyrses, panicles, or racemes. Calyx 5-parted, the segments imbricated. Corolla irregular, the tube elongated, more or less enlarged above, the limb 2-lipped; upper lip 2-lobed; lower lip 3-lobed. Stamens 5, included, 4 of them antheriferous and didynamous, the 5th sterile, as long as or shorter than the others; anther-sacs divergent or connivent. Style filiform; stigma capitate. Capsule ovoid, oblong, or globose, septicidally dehiscent. Seeds numerous, angled or even, wingless. [Greek, five stamens.]

About 100 species, natives of North America and Mexico.

* More or less pubescent or glandular, at least the calyx and pedicels.

Corolla ½′–1¼′ long; leaves entire, serrate, or denticulate.
- Stem pubescent or puberulent nearly or quite to the base.
  - Thyrsus open, panicle-like.
    - Corolla densely bearded in the throat; stem leaves lanceolate. 1. *P. hirsutus.*
    - Corolla scarcely bearded in the throat; stem leaves ovate. 2. *P. canescens.*
  - Thyrsus narrow, raceme-like or spike-like.
    - Corolla-tube abruptly enlarged; sterile filament densely woolly. 3. *P. cristatus.*
    - Corolla-tube gradually enlarged; sterile filament slightly bearded. 4. *P. albidus.*
- Only the inflorescence, or pedicels, or calyx pubescent.
  - Thyrsus open, panicle-like.
    - Stem leaves oblong, ovate, or lanceolate.
      - Corolla white, abruptly enlarged, 1′–1¼′ long. 5. *P. Digitalis.*
      - Corolla purplish, gradually enlarged, 8″–10″ long. 6. *P. Pentstemon.*
    - Stem leaves linear-lanceolate. 7. *P. gracilis.*
  - Thyrsus narrow, interrupted; calyx viscid. 8. *P. tubiflorus.*

Corolla 2′ long, the tube much enlarged above; leaves dentate. 9. *P. Cobaea.*

* * Completely glabrous throughout, mostly glaucous.

Leaves lanceolate, oblong, ovate, obovate, or orbicular.
- Stem leaves rounded, clasping; flowers 2′ long. 10. *P. grandiflorus.*
- Stem leaves acute or acuminate; flowers 9″–15″ long.
  - Corolla 9″–10″ long; stem leaves lanceolate. 11. *P. acuminatus.*
  - Corolla 1′–1½′ long; stem leaves mostly oblong. 12. *P. glaber.*

Leaves linear or linear-lanceolate; flowers densely thyrsoid.
- Bracts lanceolate, small; flowers 6″–8″ long. 13. *P. angustifolius.*
- Bracts ovate, acuminate, large; flowers 1′ long or more. 14. *P. Haydeni.*

1. Pentstemon hirsùtus (L.) Willd. Hairy Beard-tongue. (Fig. 3247.)

Chelone hirsuta L. Sp. Pl. 611. 1753.
P. pubescens Soland. in Ait. Hort. Kew. 3: 360. 1789.
Pentstemon hirsutus Willd. Sp. Pl. 3: 227. 1801.

Stem slender, erect, downy nearly or quite to the base, 1°–3° high. Leaves puberulent or glabrous, denticulate or the uppermost entire, the basal oblong or ovate, obtusish at the apex, 2′–4½′ long, ½′–2′ wide, narrowed into petioles, the upper sessile, lanceolate, mostly acuminate, sessile or slightly clasping; inflorescence thyrsoid, rather loose, glandular-pubescent; pedicels mostly short; corolla purplish or violet, the tube gradually dilated above, 2-grooved on the lower side, about 10″ long, the throat nearly closed by the villous palate at the base of the lower lip; sterile filament densely bearded for about one-half its length.

In dry woods and thickets, Maine to Ontario and Manitoba, south to Florida, Minnesota and Texas. May–July.

2. Pentstemon canéscens Britton. Gray Beard-tongue. (Fig. 3248.)

Pentstemon laevigatus var. *canescens* Britton, Mem. Torr. Club, 2: 30. 1890.
P. canescens Britton, Mem. Torr. Club, 5: 291. 1894.

Densely and finely canescent or puberulent, or the leaves sometimes nearly glabrous; stem rather stout, 1°–3° high. Leaves denticulate, the lower and basal ones oval, obtuse, narrowed into long margined petioles, the next 1 or 2 pairs contracted below the middle and somewhat fiddle-shaped, 3′–6′ long, the upper ovate or ovate-lanceolate, acuminate, clasping; thyrsus elongated, open, glandular-pubescent, leafy-bracted below; pedicels very short; calyx-segments lanceolate, acuminate; corolla purple or nearly white, about 1′ long, slightly or not at all bearded in the throat; sterile filament slightly bearded for about one-third its length; capsule ovoid, glabrous, longer than the calyx.

In dry woods, Virginia, West Virginia and North Carolina, in and near the mountains. May–June.

3. Pentstemon cristàtus Nutt. [Crested Beard-tongue. (Fig. 3249.)

Pentstemon cristatus Nutt. Gen. 2: 52. 1818.

Puberulent below, glandular-villous and viscid above; stem rather stout, leafy, 6′–18′ high, Leaves firm, entire or repand, the lower and basal ones oblong or spatulate, obtuse or acutish, 2′–4′ long, narrowed into margined petioles, the upper sessile or somewhat clasping, acute or acuminate; thyrsus dense, narrow, leafy-bracted; flowers almost sessile; calyx-segments linear-lanceolate, acuminate, villous when young; corolla about 1′ long, rather abruptly dilated above, red or purple, its lower lip villous within; sterile filament densely long-bearded.

On plains, Manitoba and the Northwest Territory to Nebraska and Nevada. May–July.

4. Pentstemon álbidus Nutt. White-flowered Beard-tongue. (Fig. 3250.)

Pentstemon albidus Nutt. Gen. 2: 53. 1818.

Stem puberulent below, densely glandular-pubescent above, rather stout, 6′–10′ high. Basal and lower leaves spatulate or oblong, obtusish, mostly entire, the upper lanceolate or oblong, sessile, denticulate, acute or acuminate, 1½′–2½′ long, 3″–6″ wide; thyrsus narrow, raceme-like, leafy-bracted, interrupted; calyx-segments lanceolate, acuminate, viscid, one-half as long as the corolla-tube; corolla white or nearly so, 8″–10″ long, funnelform, the tube gradually dilated upward, the limb nearly equally 5-lobed, the lobes spreading; sterile filament slightly bearded with short hairs.

On dry plains, South Dakota to Colorado, Nebraska and Texas. June–Aug.

5. Pentstemon Digitàlis (Sweet) Nutt. Foxglove Beard-tongue. (Fig. 3251.)

Chelone Digitalis Sweet, Brit. Fl. Gard. 2: *pl. 120.* 1825–27.

Pentstemon Digitalis Nutt. Trans. Am. Phil. Soc. (II.) 5: 181. 1833–37.

Pentstemon laevigatus var. *Digitalis* A. Gray, Syn. Fl. 2: Part 1, 268. 1878.

Glabrous, except the glandular-pubescent inflorescence; stem rather stout, 2°–5° high. Lower and basal leaves oblong or oval, obtuse or acutish, entire or repand, 2′–7′ long, narrowed into margined petioles; upper leaves ovate, lanceolate or ovate-lanceolate, sessile and more or less cordate-clasping at the base, acuminate, sharply denticulate; thyrsus open, many-flowered; pedicels 1″–3″ long; calyx-segments lanceolate; corolla white, 1′–1¼′ long, the tube abruptly dilated, the limb moderately 2-lipped, the throat open; sterile filament bearded above.

In fields and thickets, Maine and New York to Illinois, south to Virginia and Arkansas. Doubtless escaped from cultivation in its northeastern range. May–July.

6. Pentstemon Pentstèmon (L.) Britt. Smooth Beard-tongue. (Fig. 3252.)

Chelone Pentstemon L. Sp. Pl. Ed. 2, 850. 1763.

Pentstemon laevigatus Soland. in Ait. Hort. Kew. 2: 300. 1789.

Pentstemon Pentstemon Britton, Mem. Torr. Club, 5: 291. 1894.

Glabrous, except the somewhat glandular-pubescent inflorescence; stem slender, 2°–3° high. Basal and lower leaves oblong or oval, obtuse, 3′–5′ long, narrowed into margined petioles, denticulate; upper leaves sessile or slightly clasping, acute, oblong, or lanceolate, denticulate; thyrsus open, usually many-flowered; flowers nearly sessile; calyx-segments lanceolate, acute, short; corolla purple or purplish, 8″–10″ long, the tube gradually enlarged above, the throat wide open, scarcely or not at all bearded; sterile filament thinly bearded for about one-half its length, or more densely bearded above.

In woods and thickets, Pennsylvania to Florida, west to Kentucky and Louisiana. Occasionally escaped from cultivation further east. May–July.

7. Pentstemon grácilis Nutt. Slender Beard-tongue. (Fig. 3253.)

Pentstemon gracilis Nutt. Gen. 2: 52. 1818.

Glabrous or very nearly so up to the glandular-pubescent inflorescence; stem slender, strict, 6′–18′ high. Basal and lower leaves linear-oblong or spatulate, mostly obtuse, denticulate, or entire, 1′–3′ long, narrowed into margined petioles; upper leaves sessile, linear-lanceolate or the uppermost lanceolate, acuminate, denticulate; thyrsus open, several–many-flowered; pedicels 2″–4″ long; calyx-segments lanceolate, acute or acuminate; corolla purple, 9″–12″ long, its tube gradually enlarged above, its throat wide open; sterile filament bearded for about one-half its length; capsule one-third longer than the calyx.

On moist prairies, Manitoba to Minnesota and Missouri, west to the Northwest Territory and Colorado. May–July.

8. Pentstemon tubiflòrus Nutt. Funnelform Beard-tongue. (Fig. 3254.)

Pentstemon tubiflorus Nutt. Trans. Am. Phil. Soc. (II.) 5: 181. 1833–37.

Glabrous, except the viscid-pubescent calyx and pedicels; stem slender, strict, 2°–3½° high, leafless above. Leaves oblong, ovate, or lanceolate, 1′–4′ long, obtusish or acute, the basal narrowed into broad margined petioles, the upper sessile or clasping, entire or merely undulate; thyrsus narrow, interrupted, the clusters several-flowered; pedicels 1″–3″ long, calyx-segments ovate, acuminate, short, striate-nerved; corolla nearly funnelform, white or purplish, less than 1′ long, nearly as broad when expanded, its tube gradually enlarged, the limb nearly equally five-lobed, the lobes spreading; sterile filament short bearded above; capsule ovoid, acute, about twice as long as the calyx.

In moist soil, Missouri and Kansas to Arkansas. May–July.

9. Pentstemon Cobaèa Nutt. Cobaea Beard-tongue. (Fig. 3255.)

Pentstemon Cobaea Nutt. Trans. Am. Phil. Soc. (II) 5: 182. 1833–37.

Stem stout, densely and finely pubescent below, glandular-pubescent above, 1°–2° high. Leaves oblong to ovate, firm, 3′–5′ long, dentate, the lower mostly glabrous and narrowed into margined petioles, the upper sessile or cordate-clasping, usually pubescent; thyrsus short, several–many-flowered, open; flowers about 2′ long; calyx-segments lanceolate, acuminate, 5″–7″ long; corolla purple, puberulent without, glabrous within, its tube narrow up to the top of the calyx, then abruptly dilated and campanulate, the limb obscurely 2-lipped, the lobes short, rounded, spreading; sterile filament sparingly bearded; capsule ovoid, acute, pubescent, reticulate-veined, as long as the calyx.

On dry prairies, Kansas to Texas. May–July.

10. Pentstemon grandiflòrus Nutt. Large-flowered Beard-tongue. (Fig. 3256.)

P. grandiflorus Nutt. in Fras. Cat. 1813.

Glabrous and somewhat glaucous; stem stout, 2°–4° high. Leaves all entire and obtuse, the basal ones obovate, narrowed into broad petioles, those of the lower part of the stem sessile, oblong or oval, 1′–2½′ long, the upper nearly orbicular, cordate-clasping, shorter; thyrsus open, leafy-bracted, the bracts orbicular, cordate; pedicels 2″–6″ long; flowers nearly 2′ long; calyx-segments lanceolate, acute, 3″–4″ long; corolla lavender-blue, the tube rather abruptly dilated above the calyx, the limb somewhat 2-lipped; sterile filament incurved, villous and capitate at the summit; capsule acute, 8″–10″ high, three times as long as the calyx.

On prairies, Illinois to Minnesota and South Dakota, south to Kansas. June–Aug.

11. Pentstemon acuminàtus Dougl. Sharp-leaved Beard-tongue. (Fig. 3257.)

Pentstemon acuminatus Dougl.; Lindl. Bot. Reg. *pl. 1285.* 1829.

Glabrous and glaucous; stem rather stout, strict, 6′–2° high, leafy. Leaves firm, entire, the lower and basal ones oblong or spatulate, obtuse or acute, narrowed into petioles, the upper sessile or clasping, lanceolate or ovate-lanceolate, 2′–3′ long; thyrsus narrow, sometimes 1-sided, usually leafy-bracted below; pedicels becoming 4″–8″ long in fruit; calyx-segments lanceolate, acute, 2″–3″ long; corolla blue, 9″–10″ long, its tube rather gradually dilated, the limb 2-lipped; sterile filament bearded along the dilated summit; capsule acute, twice as long as the calyx.

In dry soil, Northwest Territory to Nebraska and Texas, west to Oregon and New Mexico. May–Aug.

12. Pentstemon glàber Pursh. Large Smooth Beard-tongue. (Fig. 3258.)

Pentstemon glaber Pursh, Fl. Am. Sept. 738. 1814.

Glabrous, somewhat glaucous; stem ascending or erect, rather stout, leafy, 1°–2° high. Leaves entire, firm, the basal and lower ones narrowed into petioles, the middle ones oblong or oblong-lanceolate, acuminate, sessile, the upper lanceolate, acuminate, sessile, scarcely clasping; thyrsus narrow, elongated, densely many-flowered; pedicels 3″–7″ long in fruit; calyx segments ovate-lanceolate, scarious margined, abruptly acuminate, 3″–4″ long, their margins commonly eroded; corolla blue or purple, 1′–1½′ long, rather abruptly expanded above the calyx, the limb somewhat 2-lipped, the lobes rounded; sterile filament bearded at the slightly enlarged summit; capsule narrowly ovoid, acute, about twice as long as the calyx.

In moist soil, South Dakota to Nebraska and Arizona, west to Oregon and California. May–Aug.

13. Pentstemon angustifòlius Pursh. Pale-blue Beard-tongue. (Fig. 3259.)

Pentstemon angustifolia Pursh, Fl. Am. Sept. 738. 1814.
Pentstemon coeruleus Nutt. Gen. 2: 52. 1818.

Glabrous and glaucous; stem slender, erect, leafy, 6′–15′ high. Leaves all linear, or linear-lanceolate, entire, the lower narrowed into petioles, obtusish at the apex, the upper sessile, acute, 1½′–2½′ long, 1½″–2″ wide; thyrsus narrow, spike-like, mostly dense; bracts lanceolate, acuminate; pedicels very short; calyx-segments linear-lanceolate, acuminate, 2″–3″ long; corolla blue, or nearly white, 8″–10″ long, the tube gradually enlarged, the limb somewhat 2-lipped; sterile filament bearded at the summit.

In dry soil, western Nebraska to North Dakota and Montana. May–July.

14. Pentstemon Hàydeni S. Wats. Hayden's Beard-tongue. (Fig. 3260.)

Pentstemon Haydeni S. Wats. Bot. Gaz. 16: 311. 1891.

Glabrous, not at all glaucous or slightly so; stem decumbent, simple or branched, leafy, 1°–2° high. Leaves linear or elongated-lanceolate, entire, sessile and slightly clasping, acute, acuminate, or the lowest obtusish at the apex, 2′–5′ long, 1″–5″ wide; thyrsus narrow, dense; bracts ovate or ovate-lanceolate, large, cordate-clasping, acute, or acuminate; fruiting pedicels 2″–3″ long; calyx-segments lanceolate, striate-nerved, acuminate, 3″–5″ long; corolla blue, 1′ long or more, the tube broadly dilated above the calyx, the limb nearly equally 5-lobed; capsule acute, twice as long as the calyx.

In moist soil, Nebraska, Kansas and Wyoming.

9. COLLÍNSIA Nutt. Journ. Acad. Phil. 1: 190. *pl. 9.* 1817.

Winter-annual herbs, with opposite or verticillate leaves, and blue pink white or variegated flowers, verticillate, or solitary in the axils. Calyx campanulate, 5-cleft. Corolla irregular, the tube short, the limb 2-lipped; upper lip 2-cleft, the lobes erect or recurved; lower lip larger, 3-lobed, the lateral lobes spreading or drooping, flat, the middle one conduplicate, keel-like, enclosing the 4 declined stamens and the filiform style. Stamens didynamous. Corolla with a gland on the upper side of the tube near the base. Filiments filiform; anther-sacs confluent at the apex. Stigma small, capitate or 2-lobed. Capsule ovoid or globose, septicidally 2-valved, the valves 2-cleft. Seeds few, large, peltate concave on the inner side. [Named for Zaccheus Collins, botanist, of Philadelphia, 1764–1831.]

About 15 species, natives of North America.

Corolla 5″–8″ long, the throat shorter than the limb.
  Leaves, at least the lower, ovate or oblong; corolla-lobes notched. — 1. *C. verna.*
  Leaves lanceolate; corolla-lobes obcordate. — 2. *C. violacea.*
Corolla 2″–3″ long, the throat longer than the limb. — 3. *C. parviflora.*

1. Collinsia vérna Nutt. Blue-eyed Mary. Innocence. Broad-leaved Collinsia. (Fig. 3261.)

C. verna Nutt. Journ. Acad. Phil. 1: 190. *pl. 9.* 1817.

Glabrous or puberulent; stem slender, weak, 6′–2° long, simple or branched. Leaves thin, opposite, the lower broadly ovate or orbicular, obtuse at the apex, rounded, narrowed or subcordate at the base, crenate or entire, slender-petioled; middle leaves sessile or cordate-clasping, ovate or oblong, obtuse, dentate, 1′–2′ long, floral leaves ovate to spatulate, mostly acute, dentate or entire; upper whorls 4–6-flowered; corolla 6″–8″ long, its throat equalling or shorter than the calyx, its lower lip blue, the upper purple or nearly white, the lobes emarginate or truncate; capsule globose, 2½″–3″ in diameter, shorter than the linear calyx-lobes.

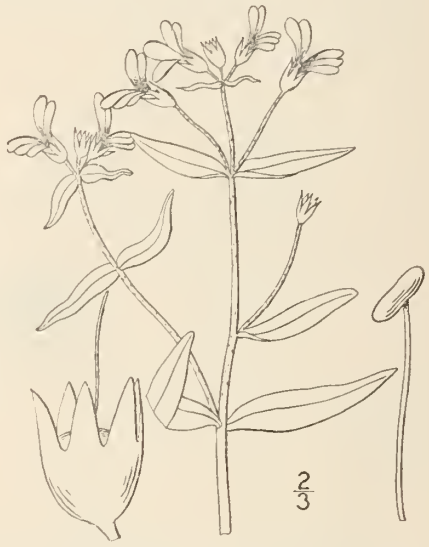
In moist woods and thickets, western New York to Wisconsin, south to Pennsylvania, Kentucky and the Indian Territory. April–June.

2. Collinsia violàcea Nutt. Violet or Narrow-leaved Collinsia. (Fig. 3262.)

Collinsia violacea Nutt. Trans. Am. Phil. Soc. (II.) 5: 179. 1833–37.

Similar to the preceding species, stem slender, erect, usually branched, 6′–15′ high. Leaves lanceolate or oblong-lanceolate, rather thick, entire or denticulate, obtuse or obtusish, the lower opposite, petioled, the middle similar, sessile, 1′–2′ long, 3″–5″ wide, the floral linear or linear-lanceolate, opposite or verticillate; upper whorls 2–5-flowered; corolla 5″–6″ long, violet, its lobes obcordate or emarginate; capsule globose, about 2″ in diameter, shorter than the lanceolate acute calyx-lobes.

Kansas (according to Holzinger) and Arkansas.



3. Collinsia parviflòra Dougl. Small-flowered Collinsia. (Fig. 3263.)

Collinsia parviflora Dougl.; Lindl. Bot. Reg. *pl. 1082.* 1827.

Puberulent, at length diffusely branched; stems very slender, 3′–15′ long. Leaves oblong or lanceolate, mostly obtuse at the apex and narrowed at the base, ½′–1′ long, entire, or sparingly toothed, the lower opposite, petioled, the floral sessile, opposite or verticillate; upper whorls 2-6 flowered; pedicels commonly longer than the flowers; corolla 2″–3″ long, about twice as long as the calyx, blue or whitish, the throat longer than the limb; capsule globose, 1″–1½″ in diameter, little shorter than the lanceolate calyx-lobes.

In moist places, Ontario to British Columbia, south to Michigan, Colorado, Arizona and Utah. April–June.

10. PAULÒWNIA Sieb. & Zucc. Fl. Jap. 1: 25. *pl. 10.* 1835.

A large tree, with the aspect of *Catalpa*, with broad opposite entire or 3-lobed, petioled pubescent leaves, and large violet flowers in terminal panicles. Calyx deeply 5 cleft, the lobes short. Corolla irregular, the tube elongated, enlarged above, the 5 lobes spreading, somewhat unequal. Stamens 4, didynamous, included; anther-sacs divaricate. Style slender, slightly thickened toward the summit, stigmatic on the inner side. Capsule coriaceous, ovoid, acute, loculicidally dehiscent. Seeds numerous, striate, winged. Flowers expanding before the leaves appear. [Named for Anna Paulowna, daughter of the Czar Paul I.]

A monotypic Japanese genus.

1. Paulownia tomentòsa (Thunb.) Baill. Paulownia. (Fig. 3264.)

Bignonia tomentosa Thunb. Fl. Jap. 252. 1784.
Paulownia imperialis Sieb. & Zucc. Fl. Jap. 1: 27. 1835.
Paulownia tomentosa Baill. Hist. Pl. 9: 434. 1888.

A tree with thin flaky bark, reaching a maximum height of about 70° and a trunk diameter of 4°, the branches stout, spreading. Leaves broadly ovate, 6′–15′ long, 4′–8′ wide, long-petioled, canescent on both sides when young, glabrate above when old, the petioles terete; flowers about 2½′ long, numerous in large erect terminal panicles; pedicels stout, densely tomentose; calyx 5-lobed, the lobes thick, tomentose; corolla slightly irregular, puberulent without; capsule 2′ high, 1′ in diameter.

Escaped from cultivation in southern New York and New Jersey and in the southern States. May–July.

11. MÍMULUS L. Sp. Pl. 634. 1753.

Erect or decumbent herbs, with opposite mostly dentate leaves. Flowers axillary, solitary, peduncled, pink, violet, or yellow, usually showy. Calyx prismatic, 5-angled, 5-toothed, the upper tooth usually the largest. Corolla irregular, its tube cylindric with a pair of ridges on the lower side within, its limb 2-lipped; upper lip erect or reflexed, 2-lobed; lower lip spreading, 3-lobed, the lobes rounded. Stamens 4, didynamous, inserted on the corolla-tube; anther-sacs divergent, or sometimes confluent at the summit. Style filiform; stigma 2-lamellate. Capsule oblong or linear, loculicidally dehiscent, many-seeded, enclosed by the calyx. [Diminutive of *mimus*, a mimic actor.]

About 30 species, natives of America. Besides the following, some 20 others occur in the western United States and British Columbia.

Corolla violet, or rarely white; eastern species.
- Leaves sessile, clasping; peduncles longer than the calyx. — 1. *M. ringens.*
- Leaves petioled; peduncles shorter than the calyx. — 2. *M. alatus.*

Corolla yellow; western; two species adventive in the East.
Plants glabrous or glabrate.
- Erect; branches spreading; leaves ovate; flowers 1′ long. — 3. *M. guttatus.*
- Diffuse; leaves nearly orbicular; flowers about 6″ long. — 4. *M. Jamesii.*

Plant villous and viscid, diffuse, musk-scented. — 5. *M. moschatus.*

1. Mimulus ringens L. Square-stemmed Monkey-flower. (Fig. 3265.)

Mimulus ringens L. Sp. Pl. 634. 1753.

Glabrous, perennial by rootstocks; stem erect, 4-sided or somewhat 4-winged, usually much branched, 1°–3° high. Leaves oblong, lanceolate, or oblong-lanceolate, pinnately veined, acuminate or acute at apex, serrate, auriculate-clasping at the base, or the lower merely sessile, 2′–4′ long, ½′–1′ wide; peduncles slender, 1′–2′ long in fruit, 2–4 times as long as the calyx; calyx teeth lanceolate-subulate; corolla violet, rarely white, about 1′ long, the throat narrow, exceeding the calyx, the lower lip puberulent within at the base; fruiting calyx oblong, 6″–8″ long; seeds oblong, minute, slightly reticulated.

In swamps and along streams, Nova Scotia to Virginia, Tennessee, Manitoba, Nebraska and Texas. Ascends to 3000 ft. in Virginia. June–Sept.

3. Mimulus guttàtus DC. Yellow Monkey-flower. (Fig. 3267.)

Mimulus guttatus DC. Cat. Hort. Monsp. 127. 1818.

Perennial by stolons, glabrous or puberulent; stem rather stout, simple or branched; branches spreading. Leaves ovate to obovate, dentate or denticulate, obtuse at the apex, rounded, narrowed or cordate at the base, 1′–3′ long, the lower short-petioled, the upper smaller, sessile or clasping; peduncles shorter than or equalling the flowers; calyx oblique; corolla yellow, 1′–2′ long, the lower lip bearded at the base, often blotched with red or purple; fruiting calyx about ½′ long; seeds longitudinally striate.

In wet meadows, Norfolk, Conn. and southern New York. Introduced from California. Summer.

2. Mimulus alàtus Soland. Sharp-winged Monkey-flower. (Fig. 3266.)

Mimulus alatus Soland. in Ait. Hort. Kew. 2: 361. 1789.

Similar to the preceding species, glabrous; stem sharply 4-angled, the angles more or less winged. Leaves ovate, ovate-lanceolate, or oblong, acute or acuminate at the apex, dentate-serrate, narrowed at the base, petioled, 2′–5′ long, 9″–18″ wide; petioles ¼′–1′ long, narrowly margined; peduncles stout, shorter than the calyx; corolla violet, about 1′ long; calyx-teeth short, broad, abruptly mucronulate; seeds smooth.

In swamps, Connecticut to Illinois, south to Georgia and Texas. June–Sept.

4. Mimulus Jàmesii T. & G. James' Mimulus. (Fig. 3268.)

Mimulus Jamesii T. & G.; Benth. in DC. Prodr. 10: 371. 1846.

Perennial by stolons, glabrous or nearly so; stems slender, creeping, diffusely branched, rooting at the nodes, 6′–18′ long. Leaves broadly ovate, orbicular or broader, very obtuse, denticulate or entire, membranous, truncate, subcordate, or rarely narrowed at the base, palmately veined, short-petioled or the upper sessile, ¼′–1′ in diameter; peduncles slender, longer than the calyx in fruit; calyx oblique, scarcely toothed, 3″–4″ long at maturity; corolla yellow, 4″–6″ long, the lower lip bearded at the base within, the throat broad; seeds nearly smooth.

In brooks and swamps, Ontario to Nebraska and Mexico, west to Montana and Arizona. May perhaps include two species. June–Sept.

5. **Mimulus moschàtus** Dougl. Musk-flower. Musk-plant. (Fig. 3269.)

Mimulus moschatus Dougl.; Lindl. Bot. Reg. *pl. 1118.* 1827.

Perennial, villous-pubescent, viscid, musk-scented; stems creeping and ascending, branched, slender, 6′–12′ long. Leaves ovate or oblong, short-petioled, acute or obtuse at the apex, denticulate, rounded or subcordate at the base, 1′–2′ long, 5″–12″ wide; peduncles slender, longer than the calyx; flowers 1′ long or less; calyx-teeth lanceolate, acuminate; corolla yellow, 2–3 times as long as the calyx.

In wet places, Locust Valley, Long Island; Middle Grove, Saratoga Co., N. Y.; Alma, N. B. (according to Macoun). Adventive from the Pacific Coast. June–Sept.

12. **CONÒBEA** Aubl. Pl. Guian. 2: 639. *pl. 258.* 1775.

Herbs, with opposite pinnately parted pinnatifid incised or serrate leaves, and small blue or white peduncled flowers, solitary or two together in the axils. Calyx 5-parted, the segments narrow, equal. Corolla irregular, the tube cylindric, the limb 2-lipped; upper lip emarginate or 2-lobed; lower lip 3-lobed. Stamens 4, didynamous, ascending, included; filaments filiform; anther-sacs parallel, not confluent. Style incurved at the summit; stigma 2-lamellate. Capsule globose, oblong or linear, septicidally dehiscent, the valves entire or 2-cleft. Seeds numerous, oblong, striate. [Guiaua name.]

About 8 species, natives of America. Besides the following, another occurs in the southwestern United States.

1. **Conobea multífida** (Michx.) Benth. Conobea. (Fig. 3270.)

Capraria multifida Michx. Fl. Bor. Am. 2: 22. *pl. 35.* 1803.
Conobea multifida Benth. in DC. Prodr. 10: 391. 1846.

Annual, finely viscid-pubescent; stem at length diffusely branched, 4′–8′ high, very leafy. Leaves petioled, ½′–1′ long, pinnately parted into 3–7 linear or linear-oblong obtuse entire or incised segments; flowers greenish-white, 2″–2½″ long, mostly solitary in the opposite axils, about as long as their filiform peduncles; calyx-segments linear-subulate, slightly shorter than the corolla; capsule narrowly ovoid, glabrous, about equalling the calyx; seeds longitudinally striate.

Along streams and rivers, Ohio to Iowa and Kansas, south to Kentucky and Texas. Introduced along the Delaware below Philadelphia. June–Sept.

13. **MONNIÈRA** P. Br. Civ. & Nat. Hist. Jam. 269. *pl. 28. f. 3.* 1755.

[HERPESTIS Gaertn. Fruct. & Sem. 3: 186. *pl. 214.* 1805.]

Erect diffuse or prostrate herbs, with opposite entire serrate, or, in some aquatic species, dissected leaves, and small yellow blue white or varicgated peduncled flowers, mostly solitary in the axils. Calyx 5-parted, the upper segment the broadest. Corolla irregular or nearly regular, the tube cylindric, the limb more or less 2-lipped; upper lip 2-lobed; lower lip 3-lobed. Stamens 4, didynamous, included; anther-sacs parallel or divergent. Style slender; stigma capitate, or 2-lobed. Capsule globose or ovoid, septicidally or loculicidally dehiscent. Seeds numerous. [Named for Louis Guillaume le Monnier, 1713–1799, professor of botany in the Jardin du Roi, Paris.]

About 60 species, natives of warm and tropical regions. In addition to the following, 2 others occur in the southern United States.

Corolla almost regular, 5-lobed; leaves spatulate. — 1. *M. Monniera.*
Corolla manifestly 2-lipped.
  Stem erect; leaves serrate, not clasping, black in drying. — 2. *M. acuminata.*
  Stem creeping or ascending; leaves entire or erenulate, clasping.
    Leaves ovate, punctate. — 3. *M. Caroliniana.*
    Leaves obovate or orbicular, not punctate. — 4. *M. rotundifolia.*

1. Monniera Monnièra (L.) Britton. Monnier's Hedge-Hyssop. (Fig. 3271.)

Gratiola Monniera L. Cent. Pl. 2: 1756.
Limosella calycina Forsk. Fl. Aeg. Arab. 112. 1775.
Herpestis cuneifolia Pursh, Fl. Am. Sept. 418. 1814.
Herpestis Monniera H.B.K. Nov. Gen. 2: 366. 1817.
M. Monniera Britton, Mem. Torr. Club, 5: 292. 1894.

Perennial, glabrous, fleshy; stem creeping, rooting at the nodes, branched, 6′–18′ long. Leaves spatulate or cuneate-obcordate, sessile, rounded at the apex, entire, or sparingly denticulate, 3″–10″ long, 1″–2½″ wide; peduncles mainly in alternate axils, slender, 2-bracteolate at the summit, in fruit longer than the leaves; flowers pale blue, about 5″ long; upper calyx-segment ovate, acute; corolla obscurely 2-lipped; stamens nearly equal; stigma slightly 2-lobed; capsule ovoid, acute, shorter than the calyx.

On shores, near the coast, Maryland to Florida, Texas and Mexico. Widely distributed in tropical regions of both the Old World and the New. June–Oct.

2. Monniera acuminàta (Walt.) Kuntze. Purple Hedge-Hyssop. (Fig. 3272.)

Gratiola acuminata Walt. Fl. Car. 61. 1788.
Malourea nigrescens Benth. Comp. Bot. Mag. 1. 173. 1835.
Herpestis nigrescens Benth. Comp. Bot. Mag. 2: 56. 1836.
M. acuminata Kuntze, Rev. Gen. Pl. 463. 1891.

Perennial, glabrous; stem erect, branched above, 1°–2° high, very leafy. Leaves oblong or oblong lanceolate, serrate, at least above the middle, short-petioled or sessile, obtuse or acute at the apex, narrowed or somewhat cuneate at the base, 1′–2′ long, faintly veined; peduncles in alternate and opposite axils, ascending, in fruit longer than the leaves, not bracteolate at the summit; flowers 5″–6″ long, purple; upper calyx-segment lanceolate, acute; corolla 2-lipped, the lower lip longer than the upper; stamens approximate in pairs; capsule oblong, 4-valved, 3″–4″ high, about equalling the calyx.

In wet soil, Maryland to Florida and Texas, near the coast. Plant blackening in drying. June–Sept.

3. Monniera Caroliniàna (Walt.) Kuntze. Blue Hedge-Hyssop. (Fig. 3273.)

Obolaria Caroliniana Walt. Fl. Car. 166. 1788.
M. amplexicaulis Michx. Fl. Bor. Am. 2: 22. 1803.
Herpestis amplexicaulis Pursh, Fl. Am. Sept. 418. 1814.
M. Caroliniana Kuntze, Rev. Gen. Pl. 463. 1891.

Perennial by stolons, more or less pubescent, fleshy; stems creeping and ascending, rooting at the lower nodes, 6′–2° long, simple, or sparingly branched, leafy. Leaves ovate to oval, sessile and clasping by a subcordate base, obtuse at the apex, parallel-veined, punctate, entire, the margins ciliolate or naked; peduncles shorter than the leaves; usually shorter than the calyx; upper calyx-segment ovate, cordate; flowers blue, 4″–5″ long, ephemeral; disk 10–12-toothed; stamens approximate in pairs.

In wet pine barrens, New Jersey to Florida and Louisiana.

4. Monniera rotundifòlia Michx. Round-leaved Hedge-Hyssop. (Fig. 3274.)

Monniera rotundifolia Michx. Fl. Bor. Am. 2: 22. 1803.
Herpestis rotundifolia Pursh, Fl. Am. Sept. 418. 1814.

Perennial by stolons, succulent; stems creeping and spreading, branched or simple, villous-pubescent, 1°–2° long. Leaves obovate or orbicular, palmately veined, entire, or slightly undulate, narrowed to a sessile or clasping base, ½′–1′ broad, glabrous, not punctate; peduncles stout, shorter than the leaves, solitary or 2 together in the axils, longer than the flowers; flowers blue, 3″–4″ long; upper calyx-segment oval; corolla 2-lipped, longer than the calyx; stamens approximate in pairs; stigma 2-lobed; disk obsolete; capsule oblong, obtuse, 1½″ high, at length 4-valved, shorter than the calyx.

On muddy shores, Illinois to Nebraska, south to Tennessee and Texas. Also in California (?) June–Sept.

14. GRATÌOLA L. Sp. Pl. 17. 1753.

Erect or diffuse glabrous glandular-pubescent or hirsute herbs, with opposite entire or dentate leaves, and yellow or whitish peduncled flowers solitary in the axils. Peduncles 2-bracteolate at the summit in the following species. Calyx 5-parted, the segments narrow, slightly unequal. Corolla irregular, its tube cylindric, its limb more or less 2-lipped; upper lip entire, emarginate, or 2-cleft; lower lip 3-lobed. Perfect stamens 2, the anterior pair wanting, or represented by rudiments; filaments filiform; anther-sacs distinct, transverse and separated by a broad connective, or parallel and contiguous. Style filiform; stigma dilated, slightly 2-lobed. Capsule loculicidally and septicidally dehiscent, ovoid or globose, 4-valved. Seeds numerous, longitudinally and transversely striate. [Latin, grace or favor, from its reputed healing properties.]

About 25 species, of wide geographic distribution in temperate and warm regions. Besides the following, some 7 others occur in southern and western North America.

Plants glabrous or glandular; anther-sacs transverse, separated.
- Sterile filaments minute or none.
  - Glandular-puberulent; flowers 4″–5″ long; capsule ovoid. — 1. *G. Virginiana.*
  - Glabrous; flowers 7″ long; capsule globose. — 2. *G. sphaerocarpa.*
- Sterile filaments 2, slender, capitate at the summit.
  - Leaves lanceolate, entire or remotely denticulate. — 3. *G. aurea.*
  - Leaves ovate or oblong, sharply serrate. — 4. *G. viscosa.*

Plant hirsute; anther-sacs parallel, contiguous. — 5. *G. pilosa.*

1. Gratiola Virginiàna L. Clammy Hedge-Hyssop. (Fig. 3275.)

Gratiola Virginiana L. Sp. Pl. 17. 1753.

Annual; stem erect, at length widely branched, glandular-puberulent, at least above, 3′–12′ high. Leaves oblong or oblong-lanceolate, sessile, narrowed to both ends, denticulate, 1′–2′ long, 2″–5″ wide, glabrous or nearly so; peduncles slender, glandular, shorter than or equalling the leaves; flowers 4″–5″ long; bractlets as long as the calyx, or longer; calyx about one-half as long as the yellowish corolla-tube; limb of the corolla short, white; sterile filaments minute or none; anther-sacs transverse, separated by a broad connective; capsule broadly ovoid, 2″ high, as long as the calyx.

In wet places, Quebec to British Columbia, south to Florida, Texas and California. Ascends to 3000 ft. in Virginia. May–Oct.

2. Gratiola sphaerocàrpa Ell. Round-fruited Hedge Hyssop. (Fig. 3276.)

Gratiola sphaerocarpa Ell. Bot. S. C. & Ga. 1: 14. 1816.

Annual, glabrous; stem ascending, or erect, rather stout, simple, or branched, 6′–12′ high. Leaves oblong or obovate-oblong, sessile, dentate or denticulate, 3–5-nerved, acute or obtusish at the apex, narrowed at the base, 1′–2′ long, 3″–8″ wide; peduncles stout, little or not at all longer than the calyx; bractlets about equalling the calyx; calyx-lobes linear; calyx nearly one-half as long as the corolla; flowers about 7″ long; corolla-tube yellow, the limb paler; anther-sacs broad, transverse; sterile filaments wanting; capsule globose, 3″ in diameter.

In wet places, southern New Jersey to Florida, west to Illinois, Texas and Mexico. June–Sept.

3. Gratiola aùrea Muhl. Goldenpert. Golden Hedge-Hyssop. (Fig. 3277.)

Gratiola aurea Muhl. Cat. 2. 1813.

Annual, glandular-puberulent, above, or glabrate; stems decumbent, creeping or ascending, simple or branched, 4′–12′ long, somewhat 4-sided. Leaves lanceolate, ½′–1′ long, 1″–3″ wide, sparingly denticulate, scarcely narrowed to the sessile and somewhat clasping base; peduncles filiform, in fruit equalling or longer than the calyx; corolla bright yellow, 6″–7″ long, 3 times as long as the calyx; sterile filaments 2, capitate at the summit; auther-sacs of the fertile stamens broad, transverse; capsule globose-ovoid, shorter than or equalling the calyx.

In sandy wet places, Quebec and Ontario to New Jersey and Florida. June–Sept.

4. Gratiola viscòsa Schwein. Viscid Hedge-Hyssop. (Fig. 3278.)

Gratiola viscosa Schwein.; LeConte, Ann. Lyc. N. Y. 1: 106. 1823.

Annual; stem weak, finely viscid-pubescent, slender, commonly simple, 6′–18′ long. Leaves ovate, ovate-oblong, or ovate-lanceolate, sharply serrate, acute at the apex, sessile, cordate-clasping at the base, ½′–1′ long; peduncles slender, shorter than or exceeding the leaves; bractlets and calyx-segments foliaceous, entire or dentate, one-third to one-half as long as the yellow or purplish corolla; flowers 5″–6″ long; sterile filaments 2, capitate at the summit; anther-sacs of the fertile stamens transverse, separated by the broad connective; capsule subglobose, shorter than the calyx.

In brooks and swamps, Kentucky to Georgia and North Carolina, in and near the mountains. May–Sept.

5. Gratiola pilòsa Michx. Hairy Hedge-Hyssop. (Fig. 3279.)

Gratiola pilosa Michx. Fl. Bor. Am. 1: 7. 1803.

Perennial (?), hirsute; stems slender, erect, strict, simple, or branched, 6′–2° high. Leaves ovate or ovate-lanceolate, dentate or denticulate, sessile, acute or obtusish at the apex, rounded, truncate or subcordate at the base, ½′–1′ long; flowers nearly or quite sessile, commonly numerous, about 4″ long; corolla purplish or white, slightly longer than the calyx and bractlets; sterile filaments 2, capitate at the summit; anther-sacs of the fertile stamens parallel, contiguous; capsule oblong-conic, acuminate, about the length of the calyx, or shorter.

In dry soil, southern New Jersey to Arkansas and Texas. May–Aug.

15. ILYSÁNTHES Raf. Ann. Nat. 13. 1820.

Annual or biennial glabrous slender branching herbs, with opposite, mostly dentate and sessile leaves, and small purplish peduncled flowers solitary in the axils. Peduncles not bracteolate. Calyx 5-parted, the segments linear. Corolla irregular, the tube somewhat expanded above, the limb 2-lipped; upper lip 2-cleft, erect; lower lip larger, 3-lobed, spreading. Fertile stamens 2, included, their anther-sacs divergent; sterile stamens 2, 2-lobed, one of the lobes capitate, glandular, the other glabrous, shorter. Style slender; stigma slightly 2-lobed. Capsule oblong or ovoid, septicidally dehiscent. Seeds numerous, wrinkled. [Greek, mud-flower.]

About 10 species, of wide geographic distribution. Besides the following, 2 or 3 others occur in the southeastern United States.

Peduncles longer than the leaves; calyx-segments shorter than the capsule. 1. *I. gratioloides.*
Peduncles shorter than the leaves; calyx-segments mostly as long as the capsule, or longer. 2. *I. attenuata.*

1. Ilysanthes gratioloides (L.) Benth. Long-stalked False Pimpernel. (Fig. 3280.)

Capraria gratioloides L. Sp. Pl. Ed. 2, 876. 1763.
Ilysanthes riparia Raf. Ann. Nat. 13. 1820.
Ilysanthes gratioloides Benth. in DC. Prodr. 10: 419. 1846.

Stem slender, mostly erect, at length diffusely branched, 3′–8′ long. Leaves ovate, ovate-oblong, or the lower obovate, sessile, or slightly clasping at the base, remotely denticulate or entire, obtuse or acutish at the apex, thickish, 3–7-nerved, ½′–1′ long, the upper ones commonly much smaller; peduncles slender, considerably exceeding the leaves; flowers 3″–5″ long; calyx-segments linear, about one-half the length of the corolla, shorter than the capsule; capsule narrowly ovoid-oblong, bluntish, 2″–3″ high; seeds 1″ long, reddish, the ends usually truncate.

In wet places, New England to Florida, west to Ontario, Minnesota and Texas. Also on the Pacific Coast. Said to occur in northeastern Asia, in South America, and to be naturalized in Europe. Lower leaves sometimes short-petioled. July–Sept.

2. **Ilysanthes attenuàta** (Muhl.) Small. Short-stalked False Pimpernel. (Fig. 3281.)

Lindernia attenuata Muhl. Cat. 59. 1813.
Ilysanthes gratioloides curtipedicellata Bush, Bull. Torr. Club, **21**: 494. 1894.
I. attenuata Small, Bull. Torr. Club, **23**: 297. 1896.

Stem erect or ascending, 3′–16′ long, the branches spreading. Leaves oblong to ovate, or sometimes obovate, ½′–1½′ long, thinnish, obtuse, serrate with a few low teeth, 3–5-nerved, narrowed into short petioles, or sessile; peduncles shorter than the leaves; calyx-segments linear-subulate, as long as the capsule, or longer; corolla 2″–6″ long; capsule narrowly ovoid, about 2″ long, pointed; seeds slightly curved, 1½″–2″ long, yellowish brown, the ends usually rounded.

In wet places, Maine and Ontario to Wisconsin, south to Florida and Missouri. Ascends to 2000 ft. in Virginia. May–Oct.

16. **MICRÁNTHEMUM** Michx. Fl. Bor. Am. **1**: 10. *pl. 12.* 1803.

Creeping or ascending, branched small leafy annual glabrous herbs, with opposite obovate oval or orbicular sessile entire leaves, and minute white or purplish short-peduncled flowers, solitary in the axils. Calyx 4–5-lobed or 4–5-parted. Corolla very irregular, the tube short, the upper lip shorter than the lower, or wanting, the lower 3-lobed, spreading or ascending, the middle lobe the largest. Stamens 2, anterior; filaments short, somewhat dilated or appendaged at the base; anthers small, their sacs distiuct, parallel, or slightly divergent. Style short; stigma 2-lobed. Capsule globose, 2-celled by a membranous partition or becoming 1-celled. Seeds numerous, minute. [Greek, small flower.]

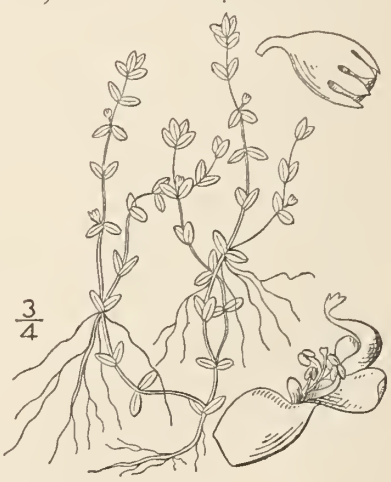
About 16 species, natives of America. Besides the following, another occurs in the southern United States.

1. Micranthemum micranthemoides (Nutt.) Wettst. Nuttall's Micranthemum. (Fig. 3282.)

Hemianthus micranthemoides Nutt. Journ. Acad. Phil. **1**: 119. *pl. 6.* 1817.
Micranthemum Nuttallii A. Gray, Man. Ed. 5, 331. 1867.
Micranthemum micranthemoides Wettst. in Engl. & Prantl, Nat. Pfl. Fam. **4**: Abt. 3b. 77. 1891.

Somewhat fleshy; stem filiform, creeping, the branches ascending, ½′–2½′ high. Leaves obovate to oval, obtuse, 1″–2½″ long; flowers about ½″ long, borne on peduncles of about the same length; calyx campanulate in flower, obovoid in fruit, 4-lobed, usually split along one side; peduncles recurved in fruit; upper lip of the corolla nearly obsolete; middle lobes of the lower lip longer than the lateral ones; appendages at the bases of the stamens nearly as long as the filaments; stigma of 2 subulate lobes; capsule obovoid-globose, ½″ in diameter, as long as the calyx.

In tidal mud, New Jersey to Florida. Also in Cuba. Aug.–Oct.



17. **LIMOSÉLLA** L. Sp. Pl. 631. 1753.

Low glabrous succulent floating or creeping, tufted annual herbs (or perennial by stolons?), with filiform stems rooting at their nodes, basal slender-petioled entire leaves, and filiform 1-flowered scape-like peduncles, the flowers small, white, pink, or purple. Calyx campanulate, 5-lobed. Corolla nearly regular, open-campanulate, the tube short, the limb 5-cleft. Stamens 4, inserted on the corolla-tube, scarcely exserted; filaments short; anther-sacs confluent. Style short; stigma capitate. Ovary 2-celled at the base, 1-celled above. Capsule globose or oblong, becoming 1-celled, many-seeded. [Greek, mud-seated.]

About 6 species, of wide geographic distribution.

Leaves expanded above into an oblong or linear-oblong blade. 1. *L. aquatica.*
Leaves filiform-linear, with little or no distinction between blade and petiole. 2. *L. tenuifolia.*

1. Limosella aquática L. Mudweed. Mudwort. (Fig. 3283.)

Limosella aquatica L. Sp. Pl. 631. 1753.

Leaves 1′–5′ long, the blade oblong, linear-oblong, or spatulate, obtuse, one-fourth or one-third as long as the filiform petiole. Peduncles shorter than the leaves, arising with the petioles from the base of the plant or from nodes of the creeping or floating stem; corolla pink or white, about 1″ broad, scarcely longer than the calyx; calyx-lobes ovate, acute or acutish, about the length of the tube; stamens inserted high up on the corolla-tube; filaments somewhat longer than the anthers; capsule globose or oblong-globose, obtuse, 1½″ high, longer than the calyx.

On muddy shores and in brooks, Labrador and Hudson Bay to the Northwest Territory, south in the Rocky Mountains to Colorado, and in the Sierra Nevada to California. Also in Europe, Australia and South America. June–Aug.

2. Limosella tenuifòlia Hoffm. Narrow-leaved Mudwort. (Fig. 3284.)

Limosella tenuifolia Hoffm. Deutsch. Fl. 29. 1804.

Limosella australis R. Br. Prodr. Fl. Nov. Holl. 1: 443. 1810.

Similar to the preceding species, but usually smaller, the leaves seldom over 1½′ high, linear-filiform, with no distinction between blade and petiole, or sometimes slightly expanded toward the apex.

In brackish mud, Labrador to New Jersey. Also in Europe, Australia and South America. The plant is very closely related to the preceding species, and is regarded by many authors as a variety of it. But its local geographic distribution is considerably different, and the leaf-characters as given above appear to be constant. Summer.

18. WULFÈNIA Jacq. Misc. 2: 60. *pl. 8.* 1781.

[SYNTHYRIS Benth. in DC. Prodr. 10: 454. 1846.]

Perennial herbs, with thick rootstocks, simple erect stems, large petioled basal leaves, those of the stem much smaller, alternate, sessile, or clasping, bract-like. Flowers small, pink or purple, in terminal dense elongated spikes or racemes. Calyx 4–5-parted, the segments oblong or linear. Corolla oblong or campanulate, 2–4-lobed, or parted, or wanting, the lateral lobes, when present, exterior in the bud. Stamens 2 (occasionally 4), posterior, inserted on the corolla, or on the outer side of the hypogynous disk, exserted; filaments slender; anther-sacs parallel or divergent, not confluent. Ovary 2-celled or rarely 3-celled; style filiform; stigma capitate. Capsule compressed, obtuse, or emarginate, many-seeded, loculicidally dehiscent. Seeds flat, oval, or orbicular. [Named for Rev. Francis Xavier Wulfen, botanical author, died 1804.]

About 10 species, natives of North America and Europe.

Corolla present, usually 2-lobed. 1. *W. Houghtoniana.*
Corolla none. 2. *W. rubra.*

1. Wulfenia Houghtoniàna (Benth.) Greene. Houghton's Wulfenia. (Fig. 3285.)

Synthyris Houghtoniana Benth. in DC. Prodr. 10: 454. 1846.
Wulfenia Houghtoniana Greene, Erythea, 2: 83. 1894.

Pubescent; stem stout, 1°–2½° high. Basal leaves ovate or orbicular, rounded at the apex, truncate, cordate or reniform at the base, crenulate all around, 2′–5′ long, 5–7-nerved, petioled, the petiole usually shorter than the blade; stem leaves small, ½′–1′ long, sessile or slightly clasping, crenulate, obtuse, or acute, passing gradually into the bracts of the dense spike; flowers greenish yellow, 2″–3″ long; corolla present, variously 2–4-lobed (commonly 2-lobed), somewhat longer than the calyx, its lobes obtuse, the stamens inserted on its base; spike much elongated in fruit; capsule emarginate, slightly exceeding the calyx.

On dry prairies, Indiana to Minnesota, Michigan and Iowa. May–July.

2. Wulfenia rùbra (Hook.) Greene. Western Wulfenia. (Fig. 3286.)

Gymnandra rubra Hook. Fl. Bor. Amer. 2: 103. *pl. 172.* 1838.
Synthyris rubra Benth. in DC. Prodr. 10: 455. 1846.
Wulfenia rubra Greene, Erythea, 2: 83. 1894.

Similar to the preceding species but lower, pubescent or tomentose, seldom over 1° high. Basal leaves ovate or oblong, obtuse or acute at the apex, narrowed, truncate or cordate at the base, 1½′–3′ long, crenulate, petioled, indistinctly nerved; stem leaves ovate or lanceolate, acute, sessile, crenulate, or entire, ¼′–1′ long; spike very dense, 1′–2′ long in flower, 2′–5′ long in fruit, its bracts purplish; corolla none; stamens inserted on the outer side of the hypogynous disk; capsule little compressed, emarginate, slightly longer than the calyx.

In dry soil, Northwest Territory to Nebraska, west to British Columbia and Utah. May–June.

19. VERÓNICA L. Sp. Pl. 9. 1753.

Annual or perennial herbs (some exotic species shrubs or trees), with opposite and alternate, rarely verticillate leaves, and mostly small blue purple pink or white flowers, terminal or axillary, racemose, spicate, or solitary. Calyx mostly 4-parted, sometimes 5-parted, the segments oblong or ovate. Corolla rotate, its tube very short, deeply and more or less unequally 4-lobed (rarely 5-lobed) the lower lobe commonly the narrowest. Stamens 2, divergent, inserted on either side and at the base of the upper corolla-lobe; anthers obtuse, their sacs confluent at the summit; filaments slender. Ovary 2-celled; style slender; stigma capitate; ovules few or numerous in each cavity. Capsule more or less compressed, sometimes very flat, emarginate, obcordate, or 2-lobed, loculicidally dehiscent. Seeds smooth or rough, flat, plano-convex, or excavated on the inner side. [Named for St. Veronica.]

About 200 species, of wide geographic distribution. Besides the following, 3 others occur in northwest America.

* Flowers racemose in the axils of the leaves, bracteolate.

Glabrous, or minutely glandular above (No. 3 rarely hairy); brook or swamp plants.
  Leaves ovate, oval, oblong, or oblong-lanceolate; capsule compressed.
    Stem leaves sessile, partly clasping, serrulate or entire. 1. *V. Anagallis-aquatica.*
    All the leaves petioled, serrate. 2. *V. Americana.*
  Leaves linear or linear-lanceolate; capsule very flat. 3. *V. scutellata.*
Pubescent, dry soil plants; leaves crenate or dentate.
  Leaves oval or obovate, petioled; pedicels shorter than the calyx. 4. *V. officinalis.*
  Leaves ovate, nearly or quite sessile; pedicels longer than the calyx. 5. *V. Chamaedrys.*

* * Flowers in terminal spikes or racemes, or solitary in the axils.

Flowers in terminal spikes.
  Leaves all sessile; capsule elliptic, emarginate. 6. *V. alpina.*
  Lower leaves petioled; capsule orbicular, obcordate. 7. *V. serpyllifolia.*
Flowers solitary in most of the axils; peduncles shorter than the leaves.
  Erect; glabrous or glandular; capsule emarginate. 8. *V. peregrina.*
  Diffuse; pubescent; capsule obcordate. 9. *V. arvensis.*

Flowers solitary in the axils; peduncles as long as the leaves, or longer.
Leaves ovate or oblong, crenate or dentate.
Corolla not longer than the calyx; capsule narrowly emarginate. 10. *V. agrestis.*
Corolla longer than the calyx; capsule broadly emarginate. 11. *V. Byzantina.*
Leaves orbicular, or broader, 3–5-lobed or -crenate. 12. *V. hederaefolia.*

1. Veronica Anagállis-aquática L. Water Speedwell. Water Pimpernel. (Fig. 3287.)

Veronica Anagallis-aquatica L. Sp. Pl. 12. 1753.

Perennial by stolons or leafy shoots developed in autumn; stem rather stout, glabrous, or glandular-puberulent above, erect or decumbent, often rooting at the lower nodes, usually branched, 1°–3° high. Leaves of sterile autumn shoots orbicular to obovate, obtuse, serrulate, narrowed into margined petioles, those of the flowering stems ovate, oblong, or lanceolate, sessile and more or less clasping or the lowest short-petioled, serrulate or entire, 1½′–4′ long, ¼′–2′ wide; racemes peduncled, borne in most of the axils, 2′–5′ long; bractlets shorter than or exceeding the pedicels; flowers blue, or purplish striped, 2″ broad; capsule compressed, not very flat, nearly orbicular, 2-lobed, emarginate, 1½″ high; seeds flat.

In brooks and swamps, Nova Scotia to British Columbia, south to eastern Virginia, Nebraska and New Mexico. Also in Europe and Asia. The plant of the Atlantic Coast appears as if introduced. Ascends to 4000 ft. in Virginia. May–Sept.

2. Veronica Americàna Schwein. American Brooklime. (Fig. 3288.)

Veronica Americana Schwein.; Benth. in DC. Prodr. 10: 468. 1846.

Similar to the preceding species, perennial by stolons or leafy shoots, glabrous throughout; stem decumbent, usually branched, rooting at the lower nodes, 6′–3° long. Leaves oblong, ovate or oblong-lanceolate, all distinctly petioled, sharply serrate, truncate, rounded, or subcordate at the base, obtuse or acutish at the apex, 1′–3′ long, ¼′–1′ wide; racemes peduncled, borne in most of the axils, loose, elongated, sometimes 6′ long; bractlets shorter than the pedicels; flower blue or nearly white, usually striped with purple, 2″ broad; capsule nearly orbicular, compressed, but not very flat, emarginate, 1½″ high; seeds flat.

In brooks and swamps, Anticosti to Alaska, south to Pennsylvania, Nebraska, New Mexico and California. Ascends to 2600 ft. in the Catskills. April–Sept.

3. Veronica scutellàta L. Marsh or Skullcap Speedwell. (Fig. 3289).

Veronica scutellata L. Sp. Pl. 12. 1753.

Glabrous, or very sparingly pubescent, rarely quite hairy, perennial by leafy shoots or stolons; stems slender, decumbent, or ascending, leafy, simple or branched, commonly rooting at the lower nodes, 6′–2° high. Leaves linear or linear-lanceolate, sessile and slightly clasping, remotely denticulate, acute, 1′–3′ long, 1″–3″ wide; racemes borne in nearly all the axils, or only in the alternate ones, equalling or longer than the leaves; bractlets much shorter than the filiform spreading pedicels; flowers blue, 2″–3″ broad; capsule broader than high, very flat, deeply emarginate at the summit, slightly so at the base, 2″–2½″ broad; seeds flat.

In swamps, Labrador to British Columbia, south to southern New York, Minnesota and California. Also in Europe and Asia. May–Sept.

4. Veronica officinàlis L. Common Speedwell. Fluellin. (Fig. 3290.)

Veronica officinalis L. Sp. Pl. 11. 1753.

Perennial by stolons, pubescent all over; stem ascending, 3′–10′ high. Leaves oblong, oval, or obovate, petioled, ½′–2′ long, obtuse at the apex, serrate, narrowed into the petioles; racemes spike-like, narrow, dense, elongated, often borne only in alternate axils, much longer than the leaves; subulate bractlets and the calyx longer than the pedicels; flowers pale blue, 2″–3″ broad; capsule obovate-cuneate, compressed, broadly emarginate, 2″ high, 1½″ broad; seeds numerous, flat.

In dry fields and woods, Nova Scotia to Ontario and Michigan, south to North Carolina and Tennessee. Ascends to 5600 ft. in Virginia. Also in Europe and Asia. Appears, in most places, as if introduced. Called also Paul's Betony, Ground-hele and Upland Speedwell. May–Aug.

5. Veronica Chamaèdrys L. Germander Speedwell. (Fig. 3291.)

Veronica Chamaedrys L. Sp. Pl. 13. 1753.

Perennial; stem ascending, simple or branched, slender, pubescent in two lines, 4′–12′ high. Leaves ovate, sessile, or very nearly so, pubescent, truncate, rounded or cordate at the base, incised-dentate, obtuse at the apex, ½′–1¼′ long; racemes borne in opposite or alternate axils, peduncled, more or less pubescent, loose, 2′–6′ long; pedicels filiform, longer that the calyx and usually longer than the bractlets; flowers light blue, 3″–4″ broad; capsule obcordate, narrowed at the base; seeds numerous, flattish.

In fields and waste places, Nova Scotia and Quebec to southern New York and Pennsylvania. Naturalized from Europe. Other English names are Blue Eye, Eyebright, Angel's Eyes, God's Eye, Bird's Eye, Cat's Eye, Base Vervain, Forget-me-not. May–July.

6. Veronica alpìna L. Alpine Speedwell. (Fig. 3292.)

Veronica alpina L. Sp. Pl. 11. 1753.

Perennial, pubescent or nearly glabrous; stems ascending or erect, slender, usually simple, 2′–12′ high. Leaves oblong, ovate, or elliptic, sessile, mostly rounded at both ends, crenulate or entire, ½′–1′ long; flowers in a short narrow raceme at the end of the stem, light blue, 2″–3″ broad; pedicels shorter than the calyx in flower, much shorter than the bractlets, 2″–3″ long in fruit; capsule ellipsoid or slightly obovoid, moderately compressed, emarginate, 2″–3″ high; seeds numerous, flattish.

Labrador; mountains of Quebec and New England to Alaska, south in the Rocky Mountains to Colorado and in the Sierra Nevada to Nevada. Summer.

7. Veronica serpyllifòlia L. Thyme-leaved Speedwell. (Fig. 3293.)

Veronica serpyllifolia L. Sp. Pl. 12. 1753.

Perennial, puberulent or glabrous; stems slender, decumbent, branched, the branches ascending or erect, 2′–10′ high. Leaves all opposite and petioled, or the uppermost sessile, oblong, oval, or ovate, ¼′–½′ long, crenulate or entire; flowers in short spicate racemes at the end of the stem and branches; pedicels equalling or longer than the calyx, usually shorter than the bractlets; corolla pale blue with darker stripes, sometimes white, about 2″ broad; capsule broader than high, broadly obcordate or emarginate at the summit, about 1″ long, about equalling the calyx; seeds flat, numerous.

In fields and thickets, Labrador to Alaska, south to Georgia, New Mexico and California. Also in Europe, Asia and South America. Ascends to 2600 ft. in the Catskills. April–Aug.

8. Veronica peregrìna L. Purslane Speedwell. Neckweed. (Fig. 3294.)

Veronica peregrina L. Sp. Pl. 14. 1753.

Annual, glabrous, or glandular-puberulent; stem erect or ascending, simple or branched, 3′–12′ high. Leaves oblong, oval, linear or slightly spatulate, 3″–10″ long, obtuse or acutish, the lowest opposite, short-petioled, or sessile, broader than the upper and usually denticulate, the upper alternate, sessile, mostly entire, each with a short-pedicelled flower in its axil; flowers nearly white, about 1″ broad; pedicels much shorter than the calyx; capsule nearly orbicular, obcordate, usually a little shorter than the calyx, 1″–1½″ high, many-seeded, the seeds flat.

In moist places, and common as a weed in cultivated soil, Nova Scotia to British Columbia, south to Florida, Mexico and California. Also in Central and South America, and distributed as a weed in the Old World. May–Oct.

9. Veronica arvénsis L. Corn or Wall Speedwell. (Fig. 3295.)

Veronica arvensis L. Sp. Pl. 13. 1753.

Annual, pubescent; stem slender, at first simple and erect, at length much branched and diffuse, 3′–10′ long. Lower leaves ovate or oval, opposite, obtuse at both ends, crenate or crenulate, 2″–6″ long, the lowest petioled; upper leaves sessile, alternate, ovate or lanceolate, acute or acutish, commonly entire, each with a short pedicelled minute flower in its axil; pedicels shorter than the calyx; corolla blue, or nearly white, 1″ broad or less; capsule broadly obovate, obcordate, 1″ high.

In fields, woods and waste places and in cultivated soil, Nova Scotia to Ontario and Minnesota, south to Florida, Kansas and Texas. Also in Bermuda. Naturalized from Europe. Native also of Asia. March–Sept.

10. Veronica agréstis L. Procumbent, Field or Garden Speedwell. (Fig. 3296.)

Veronica agrestis L. Sp. Pl. 13. 1753.

Annual, pubescent; stems creeping or procumbent, very slender, branched, 3′–8′ long, the branches ascending or spreading. Leaves broadly ovate or oval, obtuse at the apex, rounded, truncate or subcordate at the base, crenate, all short-petioled, or the uppermost sessile, the lowest opposite, the upper alternate and each with a slender-peduncled small blue flower in its axil; peduncles equalling or longer than the leaves; corolla not exceeding the calyx; capsule broader than high, compressed, but not very flat, narrowly emarginate at the summit, 1″ high, 2″ broad; seeds few, hollowed out on the inner side.

In fields and waste places, Nova Scotia to New Jersey and Louisiana. Naturalized from Europe. Native also of Asia. Other English names are Germander Chickweed and Winter-weed. May–Sept.

11. Veronica Byzantìna (Sibth. & Smith) B.S P. Buxbaum's Speedwell. Byzantine Speedwell. (Fig. 3297.)

Veronica agrestis var. *Byzantina* Sibth. & Smith, Fl. Graec. 1: *pl. 8.* 1806.
V. Buxbaumii Tenore, Fl. Nap. 1: 7. *pl. 1.* 1811.
V. Byzantina B.S.P. Prel. Cat. N. Y. 40. 1888.

Annual, pubescent; stems diffusely branched, sprcading or ascending, 6′–15′ long. Leaves ovate or oval, short-petioled, obtuse or acutish, sometimes narrowed at the base, crenate-dentate or somewhat incisecl, 4″–12″ long, the lowest opposite, the upper all alternate and each with a slender-peduncled rather large blue flower in its axil; peduncles filiform, as long as the leaves or longer; corolla exceeding the calyx, 3″–4″ broad; capsule twice as broad as high, 3″ broad, with a wide and shallow emargination at the summit; seeds few or several, hollowed out on the inner side.

In waste places, Nova Scotia to southern New York. Adventive or naturalized from Europe. Native also of Asia. Also called Bird's Eye and Cat's Eye. May–Sept.

12. Veronica hederaefòlia L. Ivy-leaved Speedwell. (Fig. 3298.)

Veronica hederaefolia L. Sp. Pl. 13. 1753.

Annual, pubescent; stems slender, diffusely branched, 3′–18′ long. Leaves orbicular or broader, truncate or subcordate at the base, 3–5-lobed or 3–5-crenate, petioled, ¼′–1′ in diameter, the lower opposite, the upper all alternate and with slender peduncled small blue flowers in their axils; peduncles filiform, often longer than the leaves; corolla 2″ broad, scarcely longer than the calyx; capsule little compressed, 2-lobed, broader than high, shorter than the densely ciliate sepals, 2–4-seeded; seeds excavated on the inner side.

In thickets, fields and waste places, southern New York, Pennsylvania and New Jersey. Naturalized from Europe. Native also of Asia. April-Oct. Other names are Ivy-Chickweed, Mother-of-Wheat, Small Henbit, Winter-weed, and Morgeline.

20. LEPTÁNDRA Nutt. Gen. 1: 7. 1818.

Tall stout erect perennial herbs, with verticillate or opposite leaves, and small minutely bracted white or blue flowers, in dense peduncled spike-like racemes, terminal, or in the upper axils. Calyx 4-parted, short. Corolla tubular, or salverform, nearly regular, 4-lobed, the tube cylindric, longer than the lobes. Stamens 2, exserted, inserted low down on the corolla-tube; filaments filiform; anthers obtuse, short. Style about as long as the stamens, stigma minute. Capsule narrowly ovoid, scarcely compressed, not emarginate nor obcordate, 4-valved at the apex. Seeds numerous, oval, minutely reticulated. [Greek, slender stamens, referring to the filaments.]

Two species, 1 native of eastern North America, the other of northeastern Asia.

1. Leptandra Virgínica (L.) Nutt. Culver's-root. (Fig. 3299.)

Veronica Virginica L. Sp. Pl. 9. 1753.
Leptandra Virginica Nutt. Gen. 1: 7. 1818.

Stem glabrous, or very nearly so, simple, strict, 2°–7° high. Leaves verticillate in 3's–9's or some of the uppermost opposite, lanceolate or oblong-lanceolate, short-petioled, long-acuminate at the apex, sharply serrulate, narrowed at the base, pinnately veined, glabrous both sides, or pubescent beneath, 3′–6′ long, ½′–1′ wide; spike-like racemes several or rarely solitary, 3′–9′ long, very dense, the terminal one first developing; pedicels and bractlets about as long as the calyx; calyx-segments ovate-lanceolate, acute; corolla tubular, white or bluish, 2″ long; capsule ovoid-oblong, 1″–1½″ long, 2–3 times as long as the calyx.

In meadows, moist woods and thickets, Nova Scotia to British Columbia, south to Alabama, Missouri, and Nebraska. Ascends to 2700 ft. in Virginia. Called also Black-root and Culver's Physic. June–Sept.

21. DIGITÀLIS L. Sp. Pl. 621. 1753.

Tall biennial or perennial herbs, the stems simple, or branched at the base, with alternate dentate or entire leaves, and large showy purple yellowish or white flowers, in long terminal commonly 1-sided racemes. Calyx 5-parted, the segments imbricated. Corolla declined, somewhat irregular, the tube contracted above the ovary, then rather abruptly expanded, longer than the 4–5-lobed slightly 2-lipped limb; upper lip broadly emarginate or 2-cleft; lower lip 3-lobed, the middle lobe largest, the lateral ones exterior in the bud. Stamens 4, didynamous, ascending, mostly included; anthers approximate in pairs. Style slender; stigma 2-lobed. Capsule ovoid, septicidally dehiscent. Seeds numerous, rugose. [Latin, *digitale*, the finger of a glove, which the flowers resemble.]

About 20 species, natives of Europe and Asia.

1. Digitalis purpùrea L. Purple Foxglove. Thimbles. Fairy Cap. (Fig. 3300.)

Digitalis purpurea L. Sp. Pl. 621. 1753.

Usually biennial, pubescent; stem stout, erect, 2°–5° high. Basal and lower leaves ovate or ovate-lanceolate, 6′–10′ long, slender petioled, acute at the apex, narrowed at the base, dentate; upper leaves similar, smaller, sessile; racemes 1° long or more, dense, 1-sided; flowers purple, 1½′–2′ long, drooping; upper calyx-segment narrower than the four other foliaceous ones; corolla spotted within.

Cape Breton Island, apparently naturalized from Europe (according to Macoun); sparingly escaped from cultivation. June–Aug. Among some 60 English names are Folk's-glove [by corruption Foxglove], *i. e.*, Fairy's-glove, Fairy-thimbles, -fingers, -weed, Fairy Bells, Pop-dock or -glove, Rabbit's-flower, Cottagers, Lion's Mouth, Scotch Mercury, Throatwort, Lady-fingers, -glove, -thimble.

22. BÙCHNERA L. Sp. Pl. 630. 1753.

Erect, perennial or biennial, simple or branched, strict hispid or scabrous herbs, blackening in drying, the lower leaves opposite, the upper sometimes alternate. Flowers rather large, white, blue, or purple, in dense terminal bracted spikes, the lower commonly distant. Calyx tubular, or oblong, 5–10-nerved, 5-toothed. Corolla salverform, its tube cylindric, somewhat curved, its limb deeply and nearly equally 5-cleft, spreading, the lateral lobes exterior in the bud. Stamens 4, didynamous; anther-sacs confluent into 1. Style slender, thickened or club-shaped above; stigma small, entire or emarginate. Capsule oblong or ovoid, loculicidally dehiscent. Seeds numerous, reticulated. [Named for J. G. Buchner.]

About 30 species, natives of warm and temperate regions. Besides the following, another occurs in the southern United States.

1. Buchnera Americàna L. Blue-hearts. (Fig. 3301.)

Buchnera Americana L. Sp. Pl. 630. 1753.

Hispid and rough; stem slender, stiff, 1°–2½° high. Leaves usually all opposite, prominently veined, the lowest obovate or oblong, obtuse, narrowed into very short petioles, the middle ones oblong or oblong-lanceolate, dentate, obtuse or acute at the apex, narrowed at the base, sessile, the upper lanceolate or linear-lanceolate, entire or nearly so; spike pedunculed, 6′–10″ long in fruit, the flowers mostly opposite, nearly 1′ long; bractlets shorter than the calyx; calyx strigose; corolla purple, its lobes obovate, obtuse, 3″–4″ broad; capsule ovoid, slightly oblique, 4″ high, a little longer than the calyx.

In sandy or gravelly soil, New Jersey to western New York and Minnesota, south to Virginia, Louisiana and Arkansas. June–Sept.

23. AFZÈLIA J. G. Gmel. Syst. Nat. 2: 927. 1796.

[Seymeria Pursh, Fl. Am. Sept. 736. 1814.]

Erect stout branched annual or perennial herbs, mostly with opposite leaves, at least the lower 1–2-pinnately parted or dissected, and yellow flowers solitary in the axils, or in terminal bracted spikes or racemes. Calyx campanulate, 5-cleft or 5-parted. Corolla slightly irregular, campanulate or rotate, the tube short, broad, the limb 5-lobed, the lower lobe exterior in the bud. Stamens 4, slightly unequal, scarcely or not at all exserted; filaments short, villous, at least near the base; anthers 2-celled, the sacs parallel, distinct. Style short or slender. Capsule globose or ovoid, acute and more or less compressed at the summit. Seeds numerous, reticulated. [Named for Adam Afzelius, 1750–1812, botanical professor at Upsala.]

About 10 species, natives of North America, Mexico and Madagascar. Besides the following, 4 others inhabit the southern United States.

1. Afzelia macrophýlla (Nutt.) Kuntze. Mullen Foxglove. (Fig. 3302.)

Seymeria macrophylla Nutt. Gen. 2: 49. 1818.
Gerardia macrophylla Benth. Comp. Bot. Mag. 1: 205. 1835.
A. macrophylla Kuntze, Rev. Gen. Pl. 457. 1891.

Annual (?), pubernlent or glabrate; stem sparingly branched, or simple, 4°–6° high. Lower leaves long-petioled, pinnately parted, 6′–15′ long, their segments lanceolate, coarsely dentate, irregularly incised, or pinnatifid; upper leaves short-petioled or sessile, oblong or lanceolate, 1′–3′ long, entire, obtuse or acutish at the apex, narrowed at the base, each with a sessile flower in its axil; flowers 5″–7″ long; calyx-lobes lanceolate or ovate, acute, about as long as the tube; corolla light yellow, 2–3 times as long as the calyx, woolly in the throat; style short, club-shaped; capsule globose-ovoid, 3″–4″ high, twice as long as the calyx.

In moist thickets and along streams, Ohio to Iowa and Nebraska, south to Kentucky and Texas. Aug.–Oct.

24. DASÝSTOMA Raf. Journ. Phys. 89: 99. 1819.

Large erect simple or branched, glandular-puberulent, pubescent or glabrous, annual or perennial herbs, partly parasitic on the roots of other plants, with opposite or some alternate leaves, and large showy yellow flowers, in terminal mostly leafy-bracted racemes or panicles. Calyx campanulate or turbinate, 5-lobed, the lobes longer than or equalling the tube, sometimes foliaceous. Corolla slightly irregular, funnelform, or campanulate-funnelform, the tube villous or pubescent within, the limb spreading, 5-lobed. Stamens 4, didynamous, included, villous or pubescent; filaments slender; anthers all alike, their sacs distinct, parallel, awned at the base. Style filiform. Capsule oblong, acute, loculicidally dehiscent, many-seeded, longer than the calyx. [Greek, thick or hairy mouth, referring to the corolla.]

Six species, natives of eastern North America.

Plant glandular-pubescent; corolla pubescent without. — 1. *D. Pedicularia.*
Puberulent, cinereous or glabrous; corolla glabrous without.
  Cinereous-puberulent.
    Leaves entire, dentate, or some of the lower pinnatifid, firm. — 2. *D. flava.*
    Leaves all pinnatifid, thin. — 3. *D. grandiflora.*
  Glabrous or very nearly so throughout.
    Leaves entire, or the lowest dentate or incised. — 4. *D. laevigata.*
    Leaves, at least all but the uppermost, pinnatifid. — 5. *D. Virginica.*

1. Dasystoma Pediculària (L.) Benth. Fern-leaved or Lousewort False Foxglove. (Fig. 3303.)

Gerardia Pedicularia L. Sp. Pl. 611. 1753.
Dasystoma Pedicularia Benth. in DC. Prodr. 10: 521. 1846.

Annual or biennial, glandular-pubescent, viscid, and with some longer hairs; stem rather slender, much branched, leafy, 1°–4° high. Leaves sessile, or the lower petioled, 1–2-pinnatifid, ovate or ovate-lanceolate in outline, usually broadest at the base, 1′–3′ long, the segments incised or crenate-dentate; pedicels slender, ascending, mostly longer than the calyx, 1′–2′ long in fruit; calyx-lobes oblong, foliaceous, usually incised or pinnatifid, 3″–4″ long, corolla 1′–1½′ long, pubescent without, the limb about 1′ broad; capsule pubescent, 5″–6″ long, its beak flat.

In dry woods and thickets, Maine and Ontario to Minnesota, south to Florida and Missouri. Aug.–Sept.

2. Dasystoma flàva (L.) Wood. Downy False Foxglove. (Fig. 3304.)

Gerardia flava L. Sp. Pl. 610. 1753.
D. pubescens Benth. in DC. Prodr. 10: 520. 1846.
Dasystoma flava Wood, Bot. & Flor. 230. 1873.

Perennial, downy, grayish; stem strict, erect, simple, or with a few nearly erect branches, 2°–4° high. Leaves oblong, lanceolate or ovate-lanceolate, firm, entire, or the lower sinuate-dentate or sometimes pinnatifid, 3′–6′ long, short petioled, the lobes obtuse; the upper much smaller and sessile, passing into the bracts of the raceme; pedicels stout, usually shorter than the calyx even in fruit; calyx-lobes lanceolate, entire, about as long as the tube; corolla 1½′–2′ long, glabrous outside, its tube much expanded above; capsule 8″–10″ long, pubescent, twice as long as the calyx.

In dry woods and thickets, eastern Massachusetts to Ontario and Wisconsin, south to southern New York, Georgia and Mississippi. July–Aug.

3. Dasystoma grandiflòra (Benth.) Wood. Western False Foxglove. (Fig. 3305.)

Gerardia grandiflora Benth. Comp. Bot. Mag. 1: 206. 1835.
D. Drummondii Benth. in DC. Prodr. 10: 520. 1846.
D. grandiflora Wood, Bot. & Flor. 231. 1873.

Perennial, cinereous-puberulent and roughish; stem much branched, very leafy to the top, 2°–3° high, the branches ascending or spreading. Leaves short-petioled, thin, ovate or ovate-lanceolate in outline, all pinnatifid or deeply incised, 2′–4′ long, the lobes acute or obtuse, serrate, or nearly entire; upper leaves smaller, sessile; pedicels, even in fruit, shorter than the calyx; calyx-lobes oblong or ovate, dentate or entire, about as long as the tube; corolla 1½′–2′ long, glabrous without, its tube much expanded above.

In dry woods and thickets, Minnesota and Wisconsin to Tennessee and Texas. July–Aug.

4. Dasystoma laevigàta Raf. Entire-leaved False Foxglove. (Fig. 3306.)

Gerardia laevigata Raf. Ann. Nat. 13. 1820.
Dasystoma quercifolia var. *integrifolia* Benth. in DC. Prodr. 10: 520. 1846.
Dasystoma laevigata Raf.; Chapm. Fl. S. States, Ed. 2, 636. 1883.

Perennial, glabrous or very nearly so, not glaucous; stem strict, simple, or sparingly branched, 1°–3° high, the branches ascending. Leaves usually all petioled, lanceolate or ovate-lanceolate, 1½′–4′ long, entire, or the lowest dentate or incised; pedicels shorter than the calyx, or in fruit longer; calyx-lobes ovate-lanceolate, equalling or shorter than the tube; corolla glabrous without, 1′–1½′ long, the limb fully as broad, the tube much expanded above; capsule glabrous, twice as long as the calyx.

In dry thickets, Pennsylvania to Michigan, south to Georgia. July–Aug.

5. Dasystoma Virgínica (L.) Britton. Smooth False Foxglove. (Fig. 3307.)

Rhinanthus Virginicus L. Sp. Pl. 603. 1753.
Gerardia quercifolia Pursh, Fl. Am. Sept. 423. *pl. 19.* 1814.
D. quercifolia Benth. in DC. Prodr. 10: 520. 1846.
D. Virginica Britton, Mem. Torr. Club, 5: 295. 1894.

Perennial, glabrous and glaucous; stem strict, rather stout, usually branched, 3°–6° high, the branches ascending. Leaves usually all petioled, ovate or ovate-lanceolate in outline, the lower 1–2-pinnatifid, 4′–6′ long, the upper pinnatifid or deeply incised, the lobes lanceolate or oblong, acute, entire, or dentate; fruiting pedicels longer than the calyx; calyx-lobes ovate or ovate-lanceolate, acute, entire, about equalling the tube; corolla 1½′–2′ long, glabrous outside, its tube not widely expanded above; capsule glabrous, twice as long as the calyx.

In dry or moist woods, Maine to Minnesota, south to Florida and Illinois. July–Sept.

25. GERÀRDIA L. Sp. Pl. 610. 1753.

Erect branching annual or perennial herbs, some South American species shrubby, mainly with opposite and sessile leaves. Flowers showy, usually large, purple, violet, yellow, red, or rarely white, racemose, or paniculate, or solitary and axillary. Calyx campanulate, 5-toothed, or 5-lobed. Corolla somewhat irregular, campanulate, or funnelform, the tube broad, short, or elongated, the limb 5-lobed, slightly 2-lipped, the lower lobes exterior in the bud. Stamens 4, didynamous, included; filaments more or less pubescent; anthers 2-celled, their sacs obtuse or mucronate at the base, style filiform. Capsule globose or ovoid, loculicidally dehiscent, many-seeded. Seeds numerous, mostly angled. [Named for John Gerarde, surgeon and botanist, author of the Herbal (1597) died 1612.]

About 40 species, natives of America. Besides the following, some 10 others occur in the southern United States. Most of the species blacken in drying.

* Flowers pedicelled; anthers all alike.

Pedicels in flower shorter than the calyx, or but 1–2 times as long.
- Corolla 10″–13″ long.
  - Calyx-teeth minute; root perennial. — 1. *G. linifolia.*
  - Calyx-teeth triangular, lanceolate or oblong, acute; annuals.
    - Leaves very scabrous, filiform; capsule oblong. — 2. *G. aspera.*
    - Leaves slightly scabrous, linear; capsule globose. — 3. *G. purpurea.*
- Corolla 5″–8″ long.
  - Calyx-teeth triangular-subulate, acute. — 4. *G. paupercula.*
  - Calyx-teeth broad, short, obtuse. — 5. *G. maritima.*

Pedicels in flower 2–6 times as long as the calyx.
- Leaves linear, spreading or ascending; capsule globose.
  - Leaves ¼″–1″ wide, ½′–1½′ long; pedicels spreading. — 6. *G. tenuifolia.*
  - Leaves 1″–2″ wide, 1½′–3′ long; pedicels ascending. — 7. *G. Besseyana.*
- Leaves subulate, short, nearly erect; capsule oblong. — 8. *G. Skinneriana.*

* * Flowers sessile; anthers of the shorter stamens smaller.

Leaves lanceolate or ovate lanceolate, entire or nearly so. — 9. *G. auriculata.*
Leaves pinnately divided into 3–7 linear-segments. — 10. *G. densiflora.*

1. Gerardia linifòlia Nutt. Flax-leaved Gerardia. (Fig. 3308.)

Gerardia linifolia Nutt. Gen. 2: 47. 1818.

Perennial, glabrous and smooth; stem branched, 2°–3° high. Leaves narrowly linear, 1′–2′ long, 1″–1½″ wide, erect, the upper much smaller and subulate; pedicels erect, in flower equalling or a little longer than the calyx, longer in fruit; calyx campanulate, truncate, its teeth minute; corolla purple, about 1′ long, narrower than that of the two following species, villous within, the lobes ciliate; filaments and anthers densely villous; anther-sacs mucronate at the base; capsule globose, 2″–3″ in diameter, but little longer than the calyx.

In moist pine barrens, Delaware to Florida. Also in Cuba. Aug.–Sept.

2. Gerardia áspera Dougl. Rough Purple Gerardia. (Fig. 3309.)

G. aspera Dougl.; Benth. in DC. Prodr. 10: 517. 1846.

Annual, 1°–2° high, hispidulous-scabrous with rough stiff short whitish hairs, branched, the branches nearly erect. Leaves narrowly linear, 1′–1½′ long, less than 1″ wide, erect or ascending; pedicels equalling or becoming longer than the turbinate calyx; calyx-teeth triangular-ovate or triangular-lanceolate, acute, one-fourth to one-third as long as the tube; corolla deep purple, about 1′ long, nearly or quite glabrous within, very pubescent without, the lobes ciliate; filaments villous; anthers all alike, obtuse at the base; capsule oblong, 3″–4″ high, considerably longer than the calyx.

On dry plains and prairies, Indiana to South Dakota, south to Missouri and Arkansas. Aug.–Oct.

3. Gerardia purpùrea L. Large Purple Gerardia. (Fig. 3310.)

Gerardia purpurea L. Sp. Pl. 610. 1753.

Annual, glabrous, smooth, or roughish; stem slender, branched, 1°–2½° high, the branches spreading or ascending. Leaves narrowly linear, usually widely spreading, 1′–1½′ long, about 1″ wide, sometimes with smaller ones fascicled in their axils; flowers racemose on the branches, purple (rarely white), about 1′ long and broad; pedicels shorter than or but little longer than the campanulate calyx, even in fruit; calyx-teeth triangular-lanceolate or ovate-oblong, acute, one-third to one-half the length of the tube; corolla much expanded above, villous or nearly glabrous within, the lobes ciliolate; anthers all alike, the sacs mucronulate at the base; filaments villous; capsule globose, 2″–3″ in diameter, longer than the calyx.

In moist fields and meadows, Maine and southern Ontario to Florida, mostly near the coast. Aug.–Oct.

4. Gerardia paupércula (A. Gray) Britton. Small-flowered Gerardia. (Fig. 3311.)

Gerardia purpurea var. *paupercula* A. Gray, Syn. 2: Part 1, 293. 1878.
Gerardia intermedia Porter; A. Gray, loc. cit. As synonym. 1878.
G. paupercula Britton, Mem. Torr. Club, 5: 295. 1894.

Annual, glabrous and smooth or very nearly so; stems strict, branched above, 6′–18′ high, the branches nearly erect. Leaves narrowly linear, ½′–1′ long, ½″–1″ wide, spreading or ascending; pedicels equalling the calyx, or longer in fruit; calyx campanulate, its teeth about one-half the length of the tube, triangular-lanceolate, acute, or acuminate; corolla 6″–10″ long, rose purple, its limb about as broad, somewhat villous in the throat within, the lobes ciliate; stamens very villous; anther-sacs mucronulate at the base; capsule globose-oblong, 3″ high, longer than the calyx.

In bogs and low meadows, Quebec to New Jersey, west to Manitoba and Wisconsin. July–Sept.

5. Gerardia marítima Raf. Sea-side or Salt-marsh Gerardia. (Fig. 3312.)

Gerardia maritima Raf. Med. Rep. (II) 5: 361. 1808.

Annual, smooth and glabrous, fleshy; stem erect, usually branched, 4′–16′ high, the branches ascending. Leaves linear, thick, ½′–1′ long, 1″ wide or less, obtuse, spreading, the uppermost very small and subulate, scarcely longer than the pedicels; pedicels in flower shorter than or equalling the calyx, about twice as long in fruit; calyx-teeth broad, short, obtuse; corolla rose-purple, 5″–9″ long, glabrous, the limb about as broad; anther-sacs mucronulate at the base, capsule globose-oblong, 2″–3″ high.

In salt marshes, Maine to Florida and Louisiana. July–Aug. The southern plant has larger flowers than the northern. Flowers before the upland species.

6. Gerardia tenuifòlia Vahl. Slender Gerardia. (Fig. 3313.)

Gerardia tenuifolia Vahl, Symb. Bot. 3: 79. 1794.

Annual, glabrous; stem very slender, paniculately branched, 6′–24′ high, the branches spreading or ascending. Leaves very narrowly linear, acute, ½′–1¼′ long, ¼″–1″ wide, spreading; pedicels mostly equalling or longer than the flowers; calyx campanulate, its teeth very short, pointed; corolla light purple, spotted, rarely white, 6″–9″ long, vertically compressed when fully expanded, minutely puberulent, or glabrous; anther-sacs mucronate at the base; capsule globose or slightly obovoid, 2″–2½″ in diameter, longer than the calyx.

In dry woods and thickets, Quebec to Georgia, west to western Ontario, Illinois and Louisiana. Aug.–Oct.

Gerardia tenuifòlia aspérula A. Gray, Bot. Gaz. 4: 153. 1879.

Leaves scabrous on the upper surface, linear-filiform; corolla not compressed. On dry hills and banks, Ontario to Indiana and Missouri.

7. Gerardia Besseyàna Britton. Bessey's Gerardia. (Fig. 3314.)

Gerardia tenuifolia var. *macrophylla* Benth. Comp. Bot. Mag. 1: 209. 1835. Not *G. macrophylla* Benth. *Gerardia Besseyana* Britton, Mem. Torr. Club, 5: 295. 1894.

Annual; stem glabrous, rather stout, strict, branched, 1°–2° high, the branches ascending or nearly erect. Leaves linear, 1′–2′ long, 1″–2″ wide, scabrous, acute, ascending; pedicels ascending, longer than the flowers; calyx campanulate, its teeth triangular-subulate, one-third to one-half the length of the tube; corolla purple, 5″–6″ long; capsule globose, 2″–3″ in diameter, exceeding the calyx.

On dry hills and prairies, Iowa to Nebraska and Colorado, south to Louisiana and Kansas. July–Sept.

8. Gerardia Skinneriàna Wood. Skinner's Gerardia. (Fig. 3315.)

Gerardia Skinneriana Wood, Classbook, 408. 1847.
Gerardia parvifolia Chapm. Fl. S. States, 300. 1860.

Annual, roughish; stem strict, striate, branched, or sometimes simple, 6′–18′ high, very slender, the branches erect or ascending. Leaves setaceous, ascending or commonly erect and appressed, ½′–1′ long, ½″ wide or less, the uppermost minute; pedicels longer than the calyx, scarcely longer than the flowers, 2–4 times the length of the capsule; calyx-teeth minute; corolla light purple, 5″–6″ long and about as broad, glabrous without, its lobes ciliolate; capsule oblong, 2″–3″ high, considerably longer than the calyx.

In dry sandy woods and thickets, eastern Massachusetts to Florida, west to Minnesota, Iowa and Louisiana. Aug.–Oct.

9. Gerardia auriculàta Michx. Auricled Gerardia. (Fig. 3316.)

G. auriculata Michx. Fl. Bor. Am. 2: 20. 1803.

Annual, scabrous; stem slender, simple, or branched above, hirsute, 1°–2° high. Leaves lanceolate or ovate-lanceolate, acuminate at the apex, sessile, mostly rounded and 2-lobed at the base, or quite entire, 1′–2′ long, the basal lobes oblong or lanceolate, obtusish, short; flowers solitary in the upper axils, sessile, purple, 8″–10″ long; calyx 5-cleft, its lobes lanceolate, acute, slightly unequal, as long as or longer than the tube; corolla densely puberulent outside, glabrous within; filaments glabrous; anthers of the shorter stamens smaller than those of the longer; anther-sacs obtuse at the base; capsule oval-oblong, about ½′ high, a little shorter than the calyx.

In moist open soil, Pennsylvania to Minnesota, south to North Carolina and Kansas. Adventive at Woodbridge, N. J. July–Sept.

10. Gerardia densiflòra Benth. Cut-leaved Gerardia. (Fig. 3317.)

G. densiflora Benth. Comp. Bot. Mag. 1: 206. 1835.

Annual, scabrous and short-hispid; stems stiff, erect, branched, or simple, 1°–2½° high, very leafy. Leaves sessile, ovate in outline, ascending, about 1′ long, pinnately parted nearly to the midvein into 3–7 narrowly linear acute rigid segments less than 1″ wide; flowers 1′–1¼′ long, rose-purple, sessile in the upper axils; calyx 5-cleft, its lobes linear, acuminate, ciliate, about as long as the tube; corolla glabrous both outside and within; filaments glabrous or villous; anthers of the shorter stamens smaller than those of the longer; capsule about ¼′ high, shorter than the calyx.

On dry prairies, Kansas to Texas. Aug.–Oct.

26. CASTILLÈJA Mutis; L. f. Suppl. 47. 1781.

Herbs, parasitic on the roots of other plants, with alternate leaves, and red yellow purple or white flowers, in dense leafy-bracted spikes, the bracts often brightly colored and larger than the flowers. Calyx tubular, laterally compressed, cleft at the summit on the upper side, or also on the lower, the lobes entire or 2-toothed. Corolla very irregular, its tube not longer than the calyx, its limb 2-lipped; upper lip (galea) arched, elongated, concave or keeled, laterally compressed, entire, enclosing the 4 didynamous stamens; lower lip short, 3-lobed. Anther-sacs oblong or linear, unequal, the outer one attached to the filament by its middle, the inner one pendulous from its apex. Style filiform; stigma entire or 2-lobed. Capsule ovoid or oblong, loculicidally dehiscent, many-seeded. Seeds reticulated. [Named for Castillejo, a Spanish botanist.]

About 40 species, mostly natives of the New World. In addition to the following, about 21 others occur in the western parts of North America.

* Plants villous-pubescent.

Bracts broad, dilated, lobed, or entire.
- Stem leaves deeply and irregularly cleft into narrow segments. 1. *C. coccinea.*
- Leaves linear-lanceolate, entire, or rarely with a few lobes. 2. *C. indivisa.*

Bracts linear or linear-lanceolate, entire. 3. *C. minor.*

* * Plants glabrous, woolly at the summit, or cinereous-puberulent.

Glabrous, or tomentose at the summit; leaves lanceolate, mostly entire. 4. *C. acuminata.*

Cinereous-puberulent, pale; stem leaves cleft. 5. *C. sessiliflora.*

1. Castilleja coccínea (L.) Spreng. Scarlet Painted-cup. Indian Paint-brush. (Fig. 3318.)

Bartsia coccinea L. Sp. Pl. 602. 1753.
Castilleja coccinea Spreng. Syst. 2: 775. 1825.

Annual or biennial, villous-pubescent; stem rather slender, simple, or with few erect branches, 1°–2° high. Leaves sessile, parallel-veined, the basal oblong, obovate, or linear, tufted, mostly entire, 1′–3′ long, those of the stem deeply 3–5-cleft into linear obtusish segments, the bracts broader and shorter, 3–5-lobed or cleft, bright red or scarlet, conspicuous; flowers sessile, 10″–12″ long, usually not exceeding the bracts; calyx cleft both above and below into 2 dilated entire or retuse oblong and obtuse lobes, sometimes scarlet; corolla greenish-yellow, its tube shorter than the calyx, its upper lip much longer than the lower; capsule oblong, acute, 5″–6″ long.

In meadows and moist thickets, Maine and Ontario to Manitoba, south to Virginia, Tennessee, Kansas and Texas. Ascends to 4000 ft. in Virginia. Bracts and calyx rarely yellow. May–July.

2. Castilleja indivìsa Engelm. Entire-leaved Painted-cup. (Fig. 3319.)

Castilleja indivisa (Engelm.) Engelm. & Gray, Bost. Journ. Nat. Hist. 5: 255. 1845.

Winter-annual; stem villous pubescent, usually simple, 8′–18′ high. Leaves sessile, parallel-veined, linear to linear-lanceolate, 1′–4′ long, 1½″–3″ wide, entire, or rarely with 2–4 lateral lobes; no tuft of basal leaves; bracts dilated, obovate to spatulate, bright red; flowers sessile, about 1′ long or less, not longer than the bracts; calyx cleft as in the preceding species, and corolla similar.

In sandy soil, Kansas to Texas. Spring.

3. Castilleja mìnor A. Gray. Small-flowered Painted-cup. (Fig. 3320.)

Castilleja affinis var. *minor* A. Gray, Bot. Mex. Bound. Surv. 119. 1859.
Castilleja minor A. Gray, in Brew. & Wats. Bot. Cal. 1: 573. 1876.

Annual, villous-pubescent; stem slender, strict, simple, or with 1 or 2 erect branches, 1°–2½° high. Leaves all linear-lanceolate and entire, parallel-veined, sessile, acuminate, 2′–3′ long, the bracts similar, smaller, red or red-tipped; very narrow, equalling or longer than the short-pedicelled flowers; calyx green, cleft on both sides to about the middle, the lobes lanceolate, acute, entire, or 2-toothed; corolla yellow, 6″–10″ long, its upper lip much longer than the small lower one; capsule oblong, acute, 6″–8″ long.

In moist soil, Montana and western Nebraska to New Mexico, west to Nevada and Arizona. May–July.

4. Castilleja acuminàta (Pursh) Spreng. Lance-leaved Painted-cup. (Fig. 3321.)

Bartsia acuminata Pursh, Fl. Am. Sept. 429. 1814.
Castilleja acuminata Spreng. Syst. 2: 775. 1825.
Castilleja septentrionalis Lindl. Bot. Reg. *pl. 925.* 1825.
Castilleja pallida var. *septentrionalis* A. Gray, in Brew. & Wats. Bot. Cal. 1: 575. 1876.

Perennial, glabrous, or loosely tomentose above; stems slender, commonly clustered, 6′–2° high, usually simple. Leaves sessile, 3–5-nerved, mostly quite entire, the lower linear, the upper lanceolate, acuminate or acute at the apex, somewhat narrowed at the base, 2′–4′ long; bracts oblong, oval, or obovate, obtuse, dentate, or entire, yellowish, greenish-white or purple, as long as the sessile flowers; calyx cleft on both sides to about the middle, the lobes lanceolate, usually again 2-cleft; corolla 6″–8″ long, its upper lip 2–4 times as long as the lower; capsule oblong, 6″–8″ high.

In moist soil, Labrador to Alaska, the mountains of New England, Ontario, Minnesota, the Black Hills, in the Rocky Mountains to Colorado and to British Columbia. June–Aug.

5. Castilleja sessiliflòra Pursh. Downy Painted-cup. (Fig. 3322.)

Castilleja sessiliflora Pursh, Am. Sept. 738. 1814.

Perennial, cinerous-puberulent all over; stems stout, simple, or branched from near the base, 6′–15′ high, densely leafy. Leaves sessile, 1′–2′ long, the lowest commonly linear, obtuse and entire, the others laciniate into narrow, entire or cleft segments; bracts green, similar to the upper leaves, shorter than the sessile flowers; calyx deeper cleft on the lower side than on the upper, its lobes linear-lanceolate, acute; corolla yellowish, 1½′ long, the upper lip about twice as long as the lower, the lobes of the latter linear; capsule oblong-lanceolate, acute, 6″–8″ long.

On dry prairies, Manitoba to the Northwest Territory, south to Illinois, Nebraska, Wyoming and Texas. May–July.

27. ORTHOCÀRPUS Nutt. Gen. 2: 56. 1818.

Annual or rarely perennial herbs, mostly with alternate leaves, and yellow white or purplish flowers, in bracted usually dense spikes, the bracts sometimes brightly colored. Calyx tubular or tubular-campanulate, 4-cleft, or sometimes split down both sides. Corolla very irregular, the tube slender, the limb 2-lipped; upper lip little if any longer than the 3-lobed 1–3-saccate lower one. Stamens 4, didynamous, ascending under the upper lip; anther-sacs dissimilar, the outer one affixed by its middle, the inner pendulous from its upper end, commonly smaller. Style filiform; stigma entire. Capsule oblong, loculicidally dehiscent, many-seeded. Seeds reticulated. [Greek, erect-fruit.]

About 30 species, natives of America, mostly of the western United States, 1 or 2 Andean.

1. Orthocarpus lùteus Nutt. Yellow Orthocarpus. (Fig. 3323.)

Orthocarpus luteus Nutt. Gen. 2: 57. 1818.

Annual, rough-pubescent or puberulent; stem strict, erect, branched above, or simple, 6′–18′ high, densely leafy. Leaves erect or ascending, linear or lanceolate, entire, or sometimes 3-cleft, 1′–1½′ long, 1″–2″ wide, sessile, long-acuminate; bracts of the dense spike lanceolate, broader and shorter than the leaves, entire or 3-cleft, acute, green, mostly longer than the flowers; flowers bright yellow, 4″–5″ long; calyx-teeth acute, shorter than the tube; corolla about twice as long as the calyx, puberulent without, its upper lip ovate, obtuse, about as long as the saccate 3-toothed lower one; capsule about as long as the calyx-tube.

On dry plains and prairies, Manitoba to Minnesota and Nebraska, west to British Columbia and California. July–Sept.

28. SCHWÀLBEA L. Sp. Pl. 606. 1753.

A perennial erect finely pubescent and minutely glandular, simple or sparingly branched, leafy herb, with sessile entire 3-nerved leaves, and rather large yellowish-purple flowers in a terminal bracted spike. Calyx tubular, somewhat oblique, 10–12-ribbed, 2-bracteolate at the base, 5-toothed, the upper tooth much the smallest, the 2 lower ones partly connate; corolla very irregular, the tube cylindric, the limb 2-lipped; upper lip arched, concave, entire; lower lip somewhat shorter, 3-lobed, 2-plaited. Stamens 4, didynamous, ascending within the upper lip of the corolla; anther sacs equal. Style filiform. Capsule oblong, many-seeded. Seeds linear, with a loose reticulated testa. [Named for C. G. Schwalbe, of Holland, who wrote (1719) on Farther India.]

A monotypic genus of eastern North America.

1. Schwalbea Americàna L. Chaff-seed. (Fig. 3324.)

Schwalbea Americana L. Sp. Pl. 606. 1753.

Stem slender, strict, 1°–2° high. Leaves oblong or ovate-oblong, entire, acute at both ends, 1′–1½′ long, 2″–8″ wide, the upper gradually smaller and passing into the bracts of the rather loose spike; flowers very nearly sessile, 1′–1½′ long, longer than the bracts; bractlets at the base of the calyx linear, shorter than its tube; corolla-tube slightly exceeding the lower lobes of the calyx, these connate to near their apices; capsule enclosed by the calyx.

In wet sandy soil, eastern Massachusetts to Florida and Louisiana, near the coast. May–July.

29. EUPHRÀSIA L. Sp. Pl. 604. 1753.

Annual or perennial low mostly branched herbs, parasitic on other plants, with opposite dentate or incised leaves, and small blue yellow or white flowers in terminal leafy-bracted spikes. Calyx not bracteolate at the base, campanulate or tubular, 4-cleft (rarely 5-cleft with one of the lobes much smaller than the others). Corolla very irregular, 2-lipped, the upper lip erect, scarcely concave, 2-lobed, its margins recurved; lower lip larger, 3-lobed, spreading, its lobes either emarginate or obtuse. Stamens 4, didynamous, ascending under the upper lip of the corolla; anther-sacs equal and parallel, mucronate at the base. Capsule oblong, loculicidally dehiscent, many-seeded. Seeds oblong, longitudinally ribbed. [Greek, delight.]

About 110 species, natives of temperate and cold regions of both the northern and southern hemispheres. Besides the following, another occurs in northwestern North America.

Bracts, and usually the leaves, glandular. 1. *E. latifolia.*
Neither bracts nor leaves glandular, but usually pubescent.
Spikes elongated; bracts sharply toothed; plant 4′–10′ high. 2. *E. Americana.*
Spike short, capitate; bracts bluntly toothed; plant 1′–2′ high. 3. *E. Oakesii.*

1. Euphrasia latifòlia Pursh. Glandular Eyebright. (Fig. 3325.)

Euphrasia latifolia Pursh, Fl. Am. Sept. 430. 1814.

Annual; stem erect, simple, or with a few erect branches from near the base, pubescent with crisped hairs, 2′–7′ high. Leaves ovate to obovate, obtuse, 2-5-toothed on each side, the teeth sharp or blunt; spike 1′–4′ long, the bracts imbricated, at least above, broadly oval to orbicular, cuneate at the base, sharply toothed, glandular-pubescent beneath or also on the margins; calyx-teeth acute; corolla 3″–4″ long, lilac, or variegated; capsule oblong-elliptic, ciliate on the margins, and more or less pubescent or pilose, about as long as the calyx.

Greenland to Hudson Bay and New Brunswick. Also in northern Europe. Summer.

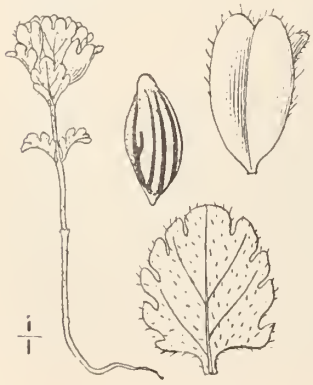
2. Euphrasia Americàna Wettst. Hairy Eyebright. (Fig. 3326.)

Euphrasia Americana Wettst. Mon. Euph. 127. 1896.

Annual, pubescent with crisped hairs; stem often at length much branched, 4′–10′ high. Leaves sessile, ovate to oval, obtuse or acutish at the apex, 3–5-toothed on each side, 3″–6″ long, 1½″–4½″ wide, the teeth acute; bracts cuneate or obtuse at the base, dentate, pubescent, not glandular, slightly shorter than the flowers; calyx-teeth lanceolate, acuminate; corolla 3″–4″ long, purplish or nearly white, its lobes emarginate; capsule narrow, cuneate, 2″–3″ high, about equalling the calyx.

In fields and on hills, Maine and New Brunswick to Newfoundland, western Ontario and Michigan, perhaps extending further west. Summer.

Euphrasia officinàlis L. is not known from North America.



3. Euphrasia Òakesii Wettst. Oakes' Eyebright. (Fig. 3327.)

Euphrasia Oakesii Wettst. Mon. Euph. 142. 1896.

Stem erect or ascending, very slender or filiform, simple, 1′–2′ high, somewhat pubescent. Stem leaves 2 or 3 pairs. Bracts and leaves orbicular or broadly oval, narrowed or nearly truncate at the base, 2″–3″ long, obtuse, pubescent, not glandular, with 2–5 blunt teeth on each side; spike short, capitate, only 3″–5″ long, the bracts densely imbricated; calyx-teeth triangular-lanceolate, short; corolla 1½″–2″ long, purplish; capsule oblong-elliptic, ciliate, longer than the calyx.

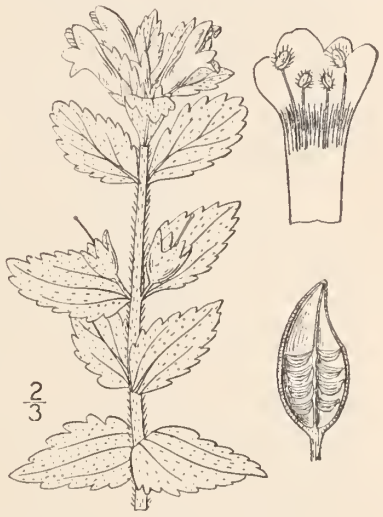
White Mountains of New Hampshire.

30. BÀRTSIA L. Sp. Pl. 602. 1753.

Annual or perennial herbs, partly parasitic on the roots of other plants, with opposite leaves, and purple pink red or yellow flowers, in terminal leafy-bracted spikes. Calyx campanulate or tubular, 4-toothed or 4-cleft. Corolla very irregular, the tube straight or recurved, the limb 2-lipped; upper lip erect, concave, entire, the margins not recurved; lower lip spreading, 3-lobed. Stamens 4, didynamous, ascending under the upper lip of the corolla; anther-sacs similar, parallel. Capsule globose, oblong, or ovoid, loculicidally dehiscent, several-many-seeded. Seeds horizontal, striate, or ribbed. [Named for John Bartsch, a Prussian botanist, died 1738.]

About 6 species of the northern hemisphere. Only the following is known to occur in North America.

1. Bartsia alpìna L. Alpine Bartsia. (Fig. 3328.)



Bartsia alpina L. Sp. Pl. 602. 1753.

Perennial by short rootstocks, pubescent; stem erect, leafy, simple, or rarely with 1 or 2 short branches, 4′–10′ high. Leaves sessile, ovate, or ovate-oblong, crenate-dentate, obtuse or acutish, rounded and sometimes slightly clasping at the base, ½′–1′ long; bracts similar, smaller, mostly shorter than the flowers; spike 1′–2′ long; flowers 8″–10″ long, sometimes borne also in the upper axils; calyx 4-cleft nearly to the middle; corolla purple, its tube much longer than the calyx; anthers pubescent, at least on the back; capsule ovoid-oblong, equalling or longer than the calyx.

Labrador to Greenland and the Arctic Sea. Also in Europe. Summer.

31. ODONTÌTES Gmel. Fl. Sib. 3: 213. 1768.

Annual erect herbs, half parasitic on the roots of other plants, with small opposite leaves, and yellow or red flowers in terminal bracted spikes or racemes. Calyx 4-toothed. Corolla with a narrow tube and a strongly 2-lipped limb, the upper lip concave, entire, or 2-lobed, the lower 3-lobed, spreading. Stamens 4, didyuamous, ascending; anther-sacs similar. Capsule mostly subglobose, loculicidally dehiscent. Seeds few, pendulous. [Greek, referring to its supposed value as a cure for toothache.]

About 20 species, mostly natives of the Mediterranean region.

1. Odontites Odontìtes (L.) Wettst. Red Bartsia. Red Eyebright. (Fig. 3329.)

Euphrasia Odontites L. Sp. Pl. 604. 1753.
Bartsia Odontites Huds. Fl. Angl. Ed. 2268. 1778.
Odontites Odontites Wettst. in Engl. & Prantl, Nat. Pfl. Fam. 4: Abt. 3b, 102. 1891.

Annual, appressed-pubescent, roughish; stem slender, at length much branched, 6′–15′ high, the branches erect or ascending. Leaves sessile, lanceolate, or oblong-lanceolate, acute or acuminate at the apex, serrate with low distant teeth, slightly narrowed at the base, ½′–1½′ long, 1″–3″ wide; spikes slender, becoming 2′–5′ long in fruit, somewhat 1-sided; bracts similar to the leaves, but smaller; flowers numerous, 4″–5″ long; calyx 4-cleft; corolla red or pink, its tube somewhat longer than the calyx; anthers slightly pubescent; capsule oblong, shorter than the calyx.

In fields and waste places, coast of Maine to Nova Scotia. Naturalized from Europe. Native also of Asia. June–Sept.

32. PEDICULÀRIS L. Sp. Pl. 603. 1753.

Herbs, with alternate opposite or rarely verticillate, pinnately lobed cleft or pinnatifid leaves, and yellow red purple or white flowers, in terminal spikes or spike-like racemes. Calyx tubular, cleft on the lower side or sometimes also on the upper, or 2–5-toothed. Corolla strongly 2-lipped, the tube cylindric, the upper lip (galea) laterally compressed, concave or conduplicate, sometimes beaked; lower lip erect or ascending, 3-lobed, the lobes spreading or reflexed, the middle one the smallest. Stamens 4, didynamous, ascending within the upper lip of the corolla; anthers approximate in pairs, their sacs transverse, equal, parallel, obtuse or rarely mucronate at the base. Capsule compressed, oblique or curved, beaked, many-seeded, loculicidally dehiscent. Seeds reticulate, pitted, striate or ribbed. [Latin, pertaining to lice, long supposed to breed lice in sheep that feed on these plants.]

About 125 species, mostly natives of the northern hemisphere. In addition to the following, some 25 others inhabit the western parts of North America. Mostly known as Lousewort; a few red-flowered species are called Red Rattle.

* Galea produced into a filiform beak 6″–8″ long. 1. *P. Groenlandica.*

* * Galea short-beaked or beakless.

Beak of the galea conic, decurved, 1″ long. 2. *P. Lapponica.*

Beak of the galea very short, or none.

Annuals or biennials; stems leafy, freely branching; northern.

Puberulent; upper leaves crenulate, lower pinnatifid. 3. *P. euphrasioides.*

Glabrous or very nearly so; leaves all pinnatifid. 4. *P. parviflora.*

Perennials; stems leafy, simple (rarely branched in No. 6).

Corolla yellow, or the galea red; plants 6′–3° high; eastern species.

Leaves pinnately lobed; capsule ovate, scarcely longer than the calyx. 5. *P. lanceolata.*

Leaves pinnately parted; capsule lanceolate, 3 times as long as the calyx. 6. *P. Canadensis.*

Lower leaves pinnately divided; capsule ovate. 7. *P. Furbishiae.*

Galea crimson or purple; plant 1′–4′ high; arctic. 8. *P. flammea.*

Perennial; stem scapose, or 1-leaved; flowers capitate; arctic. 9. *P. capitata.*

1. Pedicularis Groenlándica Retz. Long-beaked Pedicularis. (Fig. 3330.)

P. Groenlandica Retz. Fl. Scand. Ed. 2, 145. 1795.

Perennial, glabrous; stem simple, erect, 1°–1½° high. Leaves alternate, lanceolate in outline, acute or acuminate, pinnately parted or the lower pinnately divided into lanceolate acute crenulate or incised segments, the upper sessile, the lower slender-petioled, 2′–6′ long; spike 1′–6′ long, very dense; calyx 5-toothed, nearly as long as the corolla-tube, the teeth short, acutish; corolla red or purple, the galea produced into a filiform beak 6″–8″ long, which is decurved against the lower lip and upwardly recurved beyond it; body of the corolla 2½″–3″ long; capsule obliquely ovate, about 3″ long.

In wet soil, Labrador, Greenland and Hudson Bay to the Northwest Territory and British Columbia, south in the Rocky Mountains to New Mexico, and in the Sierra Nevada to California. Summer.

2. Pedicularis Lappónica L. Lapland Pedicularis. (Fig. 3331.)

Pedicularis Lapponica L. Sp. Pl. 609. 1753.

Perennial, puberulent; stems simple, or sparingly branched, leafy, 4′–8′ high. Leaves sessile, or very short-petioled, alternate or the lowest opposite, lanceolate or linear-lanceolate, obtuse or acutish at the apex, ½′–1½′ long, pinnately incised into numerous approximate oblong serrulate lobes; spike short, the flowers almost capitate, light yellow, 6″–7″ long; calyx cleft on the lower side, 2-toothed on the upper; galea erect, arched, tipped by an abruptly spreading or recurved conic beak about 1″ long.

In open places, Labrador and Greenland to the Arctic Sea. Also in Arctic Europe and Asia. Summer.

Pedicularis pedicellàta Bunge, an Alaskan species is recorded by Bunge from Labrador. It is distinguished from the above by its scapose stem, deeply pinnatifid leaves and pedicellate lower flowers. We have not seen specimens from the eastern side of the continent.

3. Pedicularis euphrasioìdes Steph. Eyebright Pedicularis. (Fig. 3332.)

P. euphrasioides Steph.; Willd. Sp. Pl. 3: 204. 1801.

Biennial or annual, puberulent; stem branched, 6′–15′ high, the branches ascending. Lower leaves petioled, lanceolate or oblong-lanceolate in outline, 2′–4′ long, 4″–8″ wide, pinnatifid into oblong obtuse crenate-dentate segments; upper leaves sessile, linear or linear-oblong, smaller, merely crenulate; flowers in a short terminal spike and solitary in the upper axils; calyx cleft on the lower side, 2–3-toothed on the upper, shorter than the corolla-tube; corolla yellow, or the galea purplish, about 6″ long; galea as long as the tube, tipped with a very short truncate beak, minutely 2-toothed on the lower side at the apex; capsule apparently shorter than the calyx.

Labrador to Greenland, the Arctic Sea, Alaska and British Columbia. Also in northern Asia. Summer.

4. Pedicularis parviflòra J. E. Smith. Purple Pedicularis. (Fig. 3333.)

P. parviflora J. E. Smith in Rees' Cyclop. 1814.
Pedicularis Wlassoviana Stev. Mem. Soc. Nat. Mosc. 6: 29. *pl. 9, f. 1.* 1823.
Pedicularis palustris var. *Wlassoviana* Bunge; Ledeb. Fl. Ross. 3: 283. 1847–49.

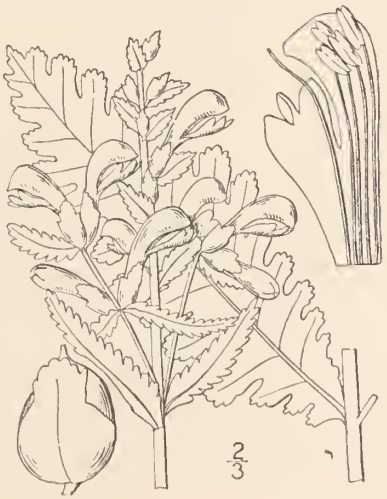
Biennial or annual, glabrous throughout, or the petiole-bases ciliate; stem erect, much branched, 1°–2° high. Leaves 1′–2′ long, alternate, or some of them opposite, oblong-lanceolate in outline, all pinnatifid into oblong crenate or incised segments; flowers in terminal rather loose spikes and solitary in the upper axils, 7″–8″ long; calyx 2 cleft, the lobes with an incised crested border; corolla purple, its tube twice as long as the calyx, the lip much shorter, the galea arched at the top, not beaked, blunt, bearing a pair of minute teeth below its summit; capsule obliquely ovate, twice as long as the calyx when mature.

Labrador to Alaska, south to Quebec, the Northwest Territory and Oregon. Summer.

Pedicularis palústris L., which differs from this in its larger flowers and apiculate galea, is reported from Newfoundland and Labrador; it is widely distributed in Europe and Asia. It is known as Red Rattle, Cow's-wort and Marsh Lousewort.

5. Pedicularis lanceolàta Michx. Swamp Lousewort. (Fig. 3334.)

Pedicularis lanceolata Michx. Fl. Bor. Am. 2: 18. 1803.
Pedicularis auriculata Smith in Rees' Cyclop. 1814.



Perennial, glabrous or very nearly so throughout; stem stout, simple, or branched above, 1°–3° high, the branches erect. Leaves alternate and opposite, lanceolate, or linear-lanceolate, 2′–5′ long, pinnately lobed, the lower petioled, the upper sessile, the lobes oblong, obtuse, short, crenate-dentate, the margins cartilaginous; spikes short; calyx 2-lobed, the lobes with foliaceous margins; corolla yellow, 8″–10″ long, the galea arched, terminated by a very short truncate beak, the lower lip erect-ascending; capsule ovate, little exceeding the calyx, about 5″ high.

In swamps, Ontario to Connecticut and Virginia, west to Manitoba, Minnesota, Ohio, Michigan, and Nebraska (according to Williams). Aug.–Oct.

6. Pedicularis Canadénsis L. Wood Betony. Lousewort. (Fig. 3335.)

Pedicularis Canadensis L. Mant. 86. 1767.

Perennial, hirsute, pubescent, or glabrate below; stems commonly tufted, ascending or erect, 6′–18′ high, simple. Leaves alternate or some of them opposite, oblong-lanceolate, 3′–5′ long, all but the uppermost slender-petioled, pinnately parted into oblong obtuse incised or dentate lobes; flowers spicate, the spike short in flower, 5′–8′ long in fruit, the lower bracts usually foliaceous, the others small; calyx cleft on the lower side; 2–3-crenate on the upper, oblique; corolla yellow, or reddish (rarely white) 7″–10″ long, the tube much longer than the calyx, the galea arched, incurved, not beaked, minutely 2-toothed below the apex; capsule lanceolate, oblique, 7″–8″ long, 2″ wide, about 3 times as long as the calyx.

In dry woods and thickets, Nova Scotia to Manitoba, south to Florida, Kansas, Colorado and North Mexico. Ascends to 3000 ft. in Virginia. Called also High Heal-all, Beefsteak plant. April–June.

7. Pedicularis Furbíshiae S. Wats. Miss Furbish's Pedicularis. (Fig. 3336.)

Pedicularis Furbishiae S. Wats. Proc. Am. Acad. 17: 375. 1882.

Perennial, pubescent, at least above; stem strict, simple, 2°–3° high. Leaves lanceolate, alternate, or some of them opposite, the lower long-petioled, 4′–6′ long, pinnately divided into ovate or oblong, pinnatifid or incised segments, the upper sessile, pinnately parted or lobed; calyx 5-lobed, the lobes entire or dentate; narrow, somewhat uncqual; corolla yellow, 7″–9″ long, the galea arched, truncate, not beaked, 2-cuspidate at the apex; capsule ovate.

In swamps and along streams, Maine and New Brunswick. July–Sept.

8. Pedicularis flámmea L. Red-tipped Pedicularis. (Fig. 3337.)

Pedicularis flammea L. Sp. Pl. 609. 1753.

Perennial, glabrous or somewhat woolly; stem simple, 2′–4′ high, with several linear-oblong, pinnately parted leaves. Basal and lower leaves slender-petioled, 1′–1½′ long, the uppermost sessile, the lobes ovate or oblong, incised-serrate; flowers about 6″ long, pedicelled in a short spike-like raceme, longer than the narrow bracts; calyx 5-toothed, the teeth lanceolate, acute, unequal; corolla-tube and the lower lip greenish yellow, the galea slightly arched, very blunt, much longer than the lower lip, its summit crimson or purple; capsule lanceolate, 6″–8″ long, 2–3 times as long as the calyx; fruiting pedicels 3″–5″ long.

Labrador to Greenland, west to Alaska. Also in arctic and alpine Europe. Summer.

9. Pedicularis capitàta Adams. Capitate Pedicularis. (Fig. 3338.)

Pedicularis capitata Adams, Mem. Soc. Nat. Mosc. 5: 100. 1817.

Perenuial, pubescent or glabrous; stem scapose, leafless, or 1-leaved, 1′–5′ high. Leaves slender-petioled, often shorter than the scape, pinnately divided, the segments ovate or oblong, incised; flowers several in a capitate cluster at the end of the scape, 1′–1½′ long; calyx 5-cleft, the lobes foliaceous, incised or crenate; corolla described as white; galea scarcely broadened above, slightly curved, very obtuse, twice as long as the lower lip; capsule oblong, a little longer than the calyx, beaked on the outer side near the summit.

Hudson Bay to Alaska. Summer.

33. RHINÁNTHUS L. Sp. Pl. 603. 1753.

Annual erect mostly branched herbs, with opposite leaves, and yellow blue violet or variegated flowers, in terminal 1-sided leafy-bracted spikes, or solitary in the upper axils. Calyx compressed, 4-toothed, much inflated, membranous and conspicuously veiny in fruit. Corolla very irregular, 2-lipped, the upper lip (galea) compressed, arched, minutely 2-toothed below the entire apex, the lower lip 3-lobed, shorter, the lobes spreading. Stamens 4, didynamous, ascending under the galea; anthers pilose, the sacs obtuse at the base, transverse, distinct. Capsule orbicular, flat, loculicidally dehiscent, several-seeded. Seeds nearly orbicular, winged. [Greek, nose-flower, from the beaked corolla.]

About 3 species, natives of the northern hemisphere.

1. Rhinanthus Crísta-Gálli L. Rattle. Rattle-box. Yellow or Penny Rattle. (Fig. 3339.)

Rhinanthus Crista-galli L. Sp. Pl. 603. 1753.
Rhinanthus minor Ehrh. Beitr. 6: 44. 1791.

Glabrous, or pubescent above; stem sleuder, usually branched, 6′–18′ high, the branches erect or ascending. Leaves lanceolate or oblong-lanceolate, sessile, coarsely serrate-dentate, acute or obtuse, 1′–2′ long, 2″–4″ wide; bracts broader, ovate, or ovate-lanceolate, incised-dentate, the teeth acuminate or subulate-tipped; flowers yellow, 6″–8″ long; corolla-tube longer than the calyx, commonly with a purple spot on one or both lips; ruiting calyx ovate-orbicular, 4″–6″ in diameter; capsule orbicular, or broader, nearly as broad as the calyx, very flat, not oblique.

Newfoundland and Labrador to Alaska and Oregon, south to Quebec, the White Mountains of New Hampshire, Ontario and in the Rocky Mountains to New Mexico; on the Atlantic Coast from Rhode Island to New Brunswick. Common in northern Europe and Asia. Called also Rattle-bags, Penny-grass. June–Aug.

34. MELAMPŸRUM L. Sp. Pl. 605. 1753.

Annual brauching herbs, with opposite leaves, and small white yellow violet or variegated flowers, solitary in the upper axils, or in terminal bracted spikes. Calyx 4-toothed, the 2 upper teeth somewhat the longer. Corolla irregular, 2-lipped, the tube narrow, gradually enlarged above, the upper lip compressed, obtuse or emarginate with a groove behind the margins, or these recurved or with a tooth on each side; lower lip spreading or ascending, 3-toothed, 2-grooved beneath. Stamens 4, didynamous, ascending under the upper lip; anther-sacs distinct, parallel, obtuse or mucronulate at the base. Capsule flat, oblique, loculicidally dehiscent, 2–4-seeded. Seeds smooth, strophiolate. [Greek, black wheat.]

About 10 species, all of the northern hemisphere. Only the following are known in North America.

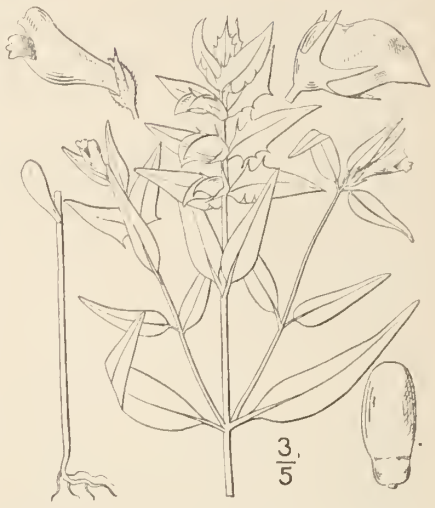
Leaves lanceolate or linear-lanceolate, the floral 2-4-toothed at the base. 1. *M. lineare.*
Leaves ovate, all entire. 2. *M. latifolium.*

1. **Melampyrum lineàre** Lam. Narrow-leaved Cow-Wheat. (Fig. 3340.)

Melampyrum lineare Lam. Encycl. 4: 22. 1797.
M. Americanum Michx. Fl. Bor. Am. 2: 16. 1803.

Puberulent; stem slender, obscurely 4-sided above, at length widely branched, 6′–1½° high. Leaves lanceolate or linear-lanceolate, short-petioled, acuminate or acute at the apex, narrowed, obtuse, or the upper truncate at the base, 1′–2½′ long, 1½″–6″ wide, the lower all entire, the upper floral ones ovate or lanceolate, with 2–6 bristle-pointed teeth near the base; flowers short-peduncled, 4″–6″ long; calyx about one-third the length of the corolla, its subulate teeth longer than its tube; corolla white or whitish, puberulent, the lower lip yellow; capsule 4″–5″ long, about 2″ wide, twice as long as the calyx.

In dry woods and thickets, Nova Scotia to British Columbia, south to North Carolina, Kentucky and Minnesota. Ascends 3500 ft. in Virginia. May–Aug.



2. **Melampyrum latifòlium** Muhl. Broad-leaved Cow-Wheat. (Fig. 3341.)

Melampyrum latifolium Muhl. Cat. 57. 1813.

Similar to the preceding, widely branched, 1°–1½° high; but the leaves all entire, short petioled, the lowest small, spatulate, obtuse, the middle ones lanceolate or ovate, acuminate, narrowed at the base, 2′–3′ long, the floral ovate or ovate-lanceolate, shorter, acute, mostly rounded at the base; corolla purple, veiny.

In dry woods, Delaware (according to Muhlenberg); Virginia to Georgia and Tennessee. June–Aug.

Family 28. **LENTIBULARIÀCEAE** Lindl. Veg. Kingd. 686. 1847.*

Bladderwort Family.

Aquatic plants, or terrestrial on moist ground, with the leaves basal and tufted, or borne on floating branching stems, or reduced to minute scales. Scapes erect. Flowers solitary or racemose, perfect, irregular, the pedicels bracteolate. Calyx inferior, 2–5-parted. Corolla 2-lipped, the upper lip usually erect, concave, or the sides plicate, entire, or 2-lobed, interior in the bud; lower lip larger, spreading or reflexed, 3-lobed, with a palate projecting into the throat and a nectariferous spur beneath. Stamens 2; anther-sacs confluent into 1. Ovary superior, ovoid or globose, 1-celled; ovules numerous; style short, or none; stigma 2-lamellate. Fruit a capsule, irregularly bursting, or dehiscent by valves. Seeds anatropous, rugose, reticulated, or bristle-bearing; endosperm none.

About 4 genera and 180 species, widely distributed in warm and temperate regions, both of the Old World and the New.

Aquatic or bog plants; foliage often dissected and bladder-bearing. 1. *Utricularia.*
Terrestrial; leaves basal, tufted, entire. 2. *Pinguicula.*

1. UTRICULÀRIA L. Sp. Pl. 18. 1753.

Herbs floating free in the water, or rooting in the mud, the aquatic species with stems usually bearing finely divided leaves and covered with minute bladders; marsh species with a few bladder-bearing leaves or rootlets under ground. Bladders contracted at the mouth, closed by an operculum and furnished with a few projecting bristles. Flowers racemose or solitary at the summits of slender scapes, the pedicels 2-bracteolate. Calyx deeply 2-lobed,

* Text contributed by the late Rev. Thomas Morong.

the lobes equal or nearly so. Corolla 2-lipped, the upper lip usually erect and entire, the lower larger, 3-lobed, spurred at the base and with a prominent palate, commonly bearded in the throat. Capsule many-seeded. [Latin, utriculus, a bag, or little bladder.]

About 150 species, of wide geographic distribution. Besides the following, 3 others occur in the southern United States.

* Scapes rooting in the mud; leaves entire; bladders usually few or none.

Scapes stout, strict, 1–10-flowered; flowers yellow, 4″–10″ broad.	
Flowers 8″–10″ broad; spur 6″ long.	1. *U. cornuta.*
Flowers 4″–5″ broad; spur 3″ long.	2. *U. juncea.*
Scape filiform, 2-bracted above; flower solitary, purple.	3. *U. resupinata.*
Scape filiform, the raceme zig-zag; flowers 1–10, yellow.	4. *U. subulata.*
Scape filiform; flowers minute, cleistogamous.	5. *U. cleistogama.*

* * Branches and finely divided leaves floating, or creeping on the mud, bladder-bearing.

† Scape bearing a whorl of leaves with inflated petioles. 6. *U. inflata.*

† † Scape leafless, or with a few minute scales.

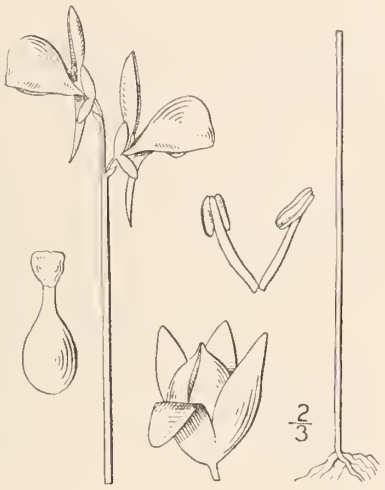
Leaves verticillate; corolla purple.	7. *U. purpurea.*
Leaves crowded, 2-3 pinnately divided; corolla yellow, large.	8. *U. vulgaris.*
Leaves scattered, dichotomously divided.	
Cleistogamous flowers among the leaves.	9. *U. clandestina.*
No cleistogamous flowers.	
Bladders mainly or entirely on leafless branches.	
Leaf-segments linear, flat.	10. *U. intermedia.*
Leaf-segments capillary.	11. *U. fibrosa.*
Bladders among the leaves.	
Flowers 2-8; spur usually reduced to a short protuberance.	12. *U. minor.*
Flowers 1–2; spur shorter than the lower lip, conic, gibbous.	13. *U. gibba.*
Flowers 1–3; spur oblong, as long as the lower lip.	14. *U. biflora.*

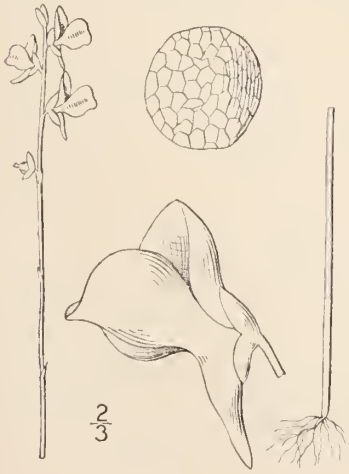
1. Utricularia cornùta Michx. Horned Bladderwort. (Fig. 3342.)

Utricularia cornuta Michx. Fl. Bor. Am. 1: 12. 1803.

Scape stout, strict, 3′–14′ high, with or without a few scattered scales, rooting in the mud. Stems and branches root-like, sometimes with a few entire leaves and few bladders, or several; flowers 1–6, yellow, fragrant; pedicels 1″–2″ long; corolla 8″–10″ broad when expanded; lower lip large, somewhat galeate, the sides strongly reflexed, with a prominent palate which projects inwardly and is pubescent at the throat; upper lip smaller, obovate; spur ½′ long, acute, curved; seeds black, rugosely pitted.

On borders of ponds, or in bogs, Newfoundland to Ontario and Minnesota, south to Florida and Texas. June–Aug.





2. Utricularia júncea Vahl. Rush Bladderwort. (Fig. 3343.)

Utricularia juncea Vahl, Enum. 1: 202. 1805.

Scape rather stout, strict, 6′–16′ high, rooting in the mud, bearing few or several minute scales. Leaves not seen; flowers 3–10, bright yellow; pedicels 1″ long, or less; corolla 4″–5″ broad when expanded, the lower lip obovate, pointed, mainly composed of the palate, the upper little smaller, obovate, emarginate; spur linear-subulate, slightly curved, or straight, about 3″ long.

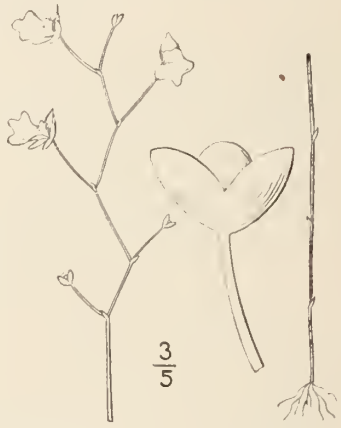
In bogs, southeastern Virginia to Florida and Texas, mostly near the coast. Also in the West Indies and South America. July–Aug.

3. Utricularia resupinàta B. D. Greene. Reversed Bladderwort. (Fig. 3344.)

Utricularia resupinata B. D. Greene; Bigel. Fl. Bost. Ed. 3, 10. 1840.

Scape filiform, 2′–7′ high, 2-bracted near the flower, arising from creeping rooting shoots which rise 1′–2′ above the ground and bear a few branches and bladders. Flower solitary, purple, resting transversely upon the summit of the scape and so appearing resupinate; corolla 3″–5″ long, the limb deeply 2-parted, remote from the conic spur.

In sandy bogs and borders of ponds, Maine to Florida, west to Michigan. Rare and local. July–Aug.

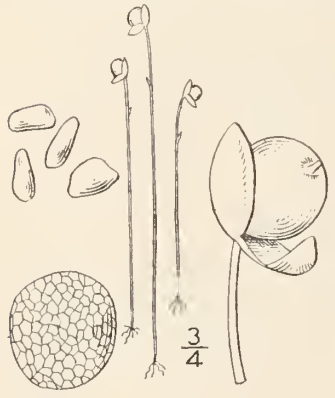


4. Utricularia subulàta L. Tiny or Zig-zag Bladderwort. (Fig. 3345.)

Utricularia subulata L. Sp. Pl. 18. 1753.
Utricularia setacea Michx. Fl. Bor. Am. 1: 12. 1803.

Scape filiform, 1′–8′ high, the racemes zig-zag. Leaves few, entire, they and the bladders seldom found; pedicels 2″–6″ long, slender; flowers 1–10, yellow; corolla 2″–3″ broad, the lower lip 3-lobed, the upper smaller, ovate; spur conic, appressed to the lower lip and equalling it in length, or shorter.

In wet, sandy soil, Nantucket to Florida, west to Texas, Mexico and Arkansas. Also in Cuba. March–Aug.



5. Utricularia cleistógama (A. Gray) Britton. Closed Bladderwort. (Fig. 3346.)

Utricularia subulata var. *cleistogama* A. Gray, Syn. Fl. 2: Part 1, 317. 1878.
U. clandestina Britton, Trans. N. Y. Acad. Sci. 9: 12. 1889.

Scape hair-like, 1′–3′ high, 1–2-flowered. Stems root-like, sparse, sending a few minute simple shoots above ground; bladders minute, seldom seen; flowers on short bracted pedicels; corolla ½″–1″ broad, strictly cleistogamous, spurless, the lips nearly equal, the lower varying from purplish to yellow, the upper white; seeds dark rugosely pitted, scarcely ¼″ in diameter; capsule globose.

In wet soil, eastern Massachusetts and in the pine-barrens of New Jersey. August.

6. Utricularia inflàta Walt. Swollen Bladderwort. (Fig. 3347.)

Utricularia inflata Walt. Fl. Car. 64. 1788.
Utricularia ceratophylla Michx. Fl. Bor. Am. 1: 12. 1803.

Scapes stout, 3′–20′ high, bearing a whorl of 5–9 leaves at about the middle. Branches long, floating, crowded with dichotomously divided leaves and covered with bladders; leaves of the scape finely dissected, their petioles cylindric, inflated, dilated upward, ½′–2′ long; flowers 2–10, yellow, about 9″ broad; upper lip of the corolla broadly ovate, obscurely lobed or crenate, the lower 3-lobed; spur conic, emarginate, appressed to the lower lip and about one-half its length; capsule nodding in fruit.

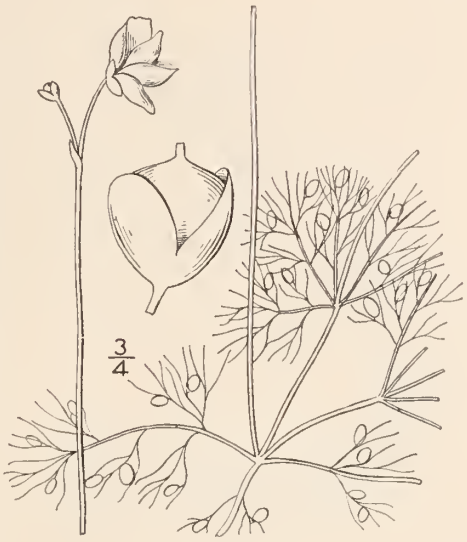
In ponds, Canada (according to Pursh); Maine to Florida and Texas, near the coast. March–Aug.

7. Utricularia purpùrea Walt. Purple Bladderwort. (Fig. 3348.)

Utricularia purpurea Walt. Fl. Car. 64. 1788.
Utricularia saccata Ell. Bot. S. C. & Ga. 2: 21. 1816.

Scape 1′–6′ high, naked, or bearing a few scales, 1–4-flowered. Branches floating, long, with numerous dichotomous capillary leaves in verticils of 4's and 5's and many large bladders; corolla violet-purple, 3″–8″ broad, the lower lip 3-lobed, the lateral lobes saccate; upper lip truncate, emarginate; spur nearly conic, appressed to the lower lip and one-half its length, or more.

In ponds, Maine to Florida, near the coast; also in Indiana. May–Aug.



8. Utricularia vulgàris L. Greater Bladderwort. Hooded Water-Milfoil. Pop-weed. (Fig. 3349.)

Utricularia vulgaris L. Sp. Pl. 18. 1753.
Utricularia macrorhiza Le Conte, Ann. Lyc. N. Y. 1: 73. 1824.

Scapes stout, naked, or with a few broad scales, 3′–14′ high. Leaves 2–3-pinnately divided, usually much crowded, the segments setaceous; branches floating, sometimes 1° long, the leaves sometimes 6″–7″ long with numerous bladders; flowers 3–20, racemose, yellow; pedicels 4″–8″ long, recurved in fruit; corolla ½′ broad or more, the sides of the lips reflexed; palate prominent; upper lip nearly entire, the lower slightly 3-lobed and longer than the conic blunt or acutish, somewhat curved spur.

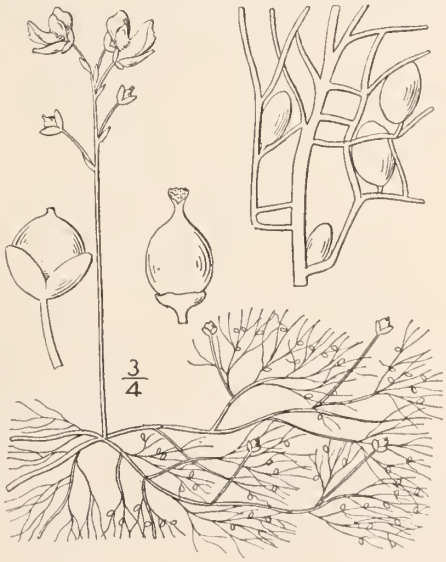
In brooks and ponds, Newfoundland to Florida, west to British Columbia and California, throughout nearly the whole of North America. Also in Europe, Asia, Cuba and Mexico. June–Aug. The plant, like others of the genus, is often propagated by winter buds.

9. Utricularia clandestìna Nutt. Hidden-fruited Bladderwort. (Fig. 3350.)

U. clandestina Nutt.; A. Gray, Man. 287. 1848.
Utricularia striata Tuckerm. Am. Journ. Sci. 45: 29. 1843. Not Le Conte, 1824.

Scape slender, 2′–5′ high, arising from long floating branches. Leaves scattered, repeatedly forked, the divisions capillary, bearing numerous bladders. Flowers of two kinds; those of the scape 3–5, complete, those among the leaves strictly cleistogamous, numerous, their pedicels reflexed in fruit; corolla of the upper complete flowers yellow, spreading, 4″–5″ broad when expanded, the lips nearly equal in length, the lower broader and 3-lobed; spur shorter than the lower lip, thick, obtuse, approximate to it.

In shallow ponds, New Brunswick to New Jersey, near the coast. July.



10. Utricularia intermèdia Hayne. Flat-leaved Bladderwort. (Fig. 3351.)

Utricularia intermedia Hayne in Schrad. Journ. Bot. 1: 18. 1800.

Scape capillary, 2′–10′ high, naked, or with a few scales. Branches floating, 2′–6′ long; leaves ¼′–½′ long, more or less scattered, 2-ranked, repeatedly dichotomous, the segments linear, flat, ⅛″ wide or less, the margins bristly-serrulate. Bladders, with rare exceptions, borne on leafless branches; flowers 1–5, yellow; corolla ½′ broad, its lower lip broad with a large palate and exceeding the upper; spur conic, sub acute, nearly as long as the lip, to which it is appressed.

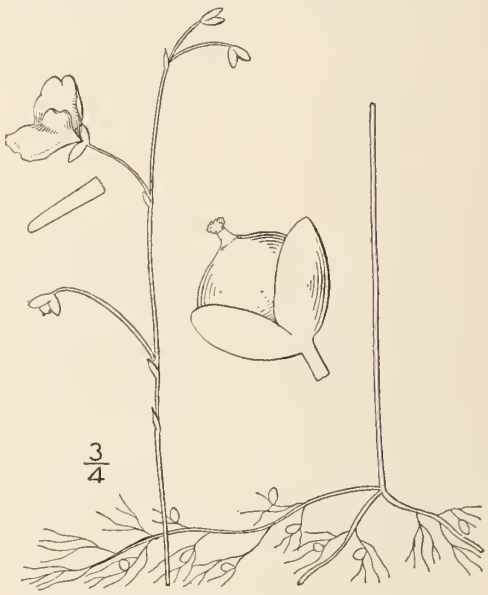
In shallow water along the margins of pools and ponds, Cape Breton to British Columbia, south to New Jersey, Minnesota and California. Also in Europe. The plant is commonly propagated by the velvety-looking winter buds, which are buried in the mud at its base. June–Aug.

11. Utricularia fibròsa Walt. Fibrous Bladderwort. (Fig. 3352.)

Utricularia fibrosa Walt. Fl. Car. 64. 1788.
Utricularia striata Le Conte, Ann. Lyc. N. Y. 1: 75. 1824.
Utricularia bipartita Chapm. Fl. S. States, 283. 1860.

Scape slender, naked, or with very few minute scales, 3′–12′ high. Leaves scattered, dichotomously divided, small or sometimes scarcely any, the segments capillary; bladders often on leafless branches, sometimes none; flowers 1–6, yellow; corolla 4″–6″ broad, the lips nearly equal, broad, the upper undulate or 3-lobed, the middle lobe striate; spur nearly linear, obtuse, ascending, nearly equalling or sometimes exceeding the lower lip.

In shallow ponds and swamps, Long Island to Florida and Louisiana, mostly in pine barrens. June–July.



12. Utricularia mìnor L. Lesser Bladderwort. (Fig. 3353.)

Utricularia minor L. Sp. Pl. 18. 1753.

Scapes slender, 2′–7′ high. Branches floating, short; leaves much scattered, dichotomously divided, the divisions few and setaceous; bladders borne among the leaves, few, often none, the largest not over 1″ long; flowers 1–10, pale yellow, racemose; corolla 2″–3″ broad, ringent, the upper lip smaller than the lower; spur usually reduced to a blunt broad protuberance, shorter than the lips; pedicels reflexed in fruit.

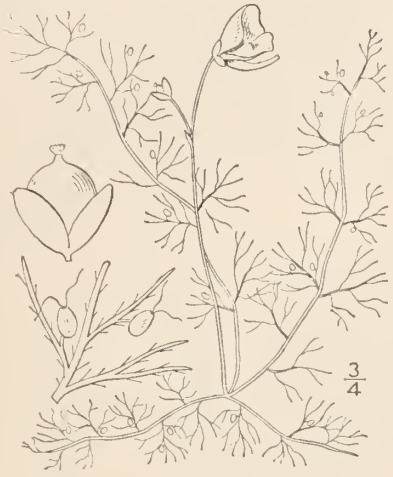
In shallow ponds and in bogs, Greenland and Labrador to British Columbia, south to New Jersey, Arkansas, Utah and California. Also in Europe. June–July.

13. Utricularia gíbba L. Humped Bladderwort. (Fig. 3354.)

Utricularia gibba L. Sp. Pl. 18. 1753.
U. fornicata Le Conte, Ann. Lyc. N. Y. 1: 76. 1824.
U. minor Torr. Fl. N. Y. 2: 21. 1843. Not L. 1753.

Scapes filiform, 1′–5′ high, arising from sparingly leafy, floating or creeping branches. Leaves root-like, in the mud or just above it, usually delicate, the divisions often only 1 or 2, capillary; bladders few and minute, borne among the leaves, the largest about ½″ long, or often none; flowers 1 or 2, yellow; corolla 3″–4″ broad, its lips rounded, broad, entire, or undulate, about equal; spur thick, conic, ascending, gibbous at the base, obtuse, shorter than the lips.

In shallow water, or in mud on the borders of ponds and pools, Ontario to Michigan, south to Alabama and Illinois. July–Aug.



14. Utricularia biflòra Lam. Two-flowered Bladderwort. (Fig. 3355.)

Utricularia biflora Lam. Ill. 1: 50. 1791.
Utricularia longirostris Le Conte, Ann. Lyc. N. Y. 1: 76. 1824.

Scapes filiform, 2′–5′ high, arising from long floating branches. Leaves scattered, their divisions few, finely capillary, often copiously bladder-bearing; flowers 1–3, yellow; corolla 4″–6″ broad, the lips rounded, nearly equal; spur narrowly oblong, blunt, curved upward, equalling the lower lip.

In shallow water on the margins of ponds, Eastern Massachusetts and Rhode Island to Illinois, south to Louisiana and Texas.

2. PINGUÍCULA L. Sp. Pl. 17. 1753.

Acaulescent herbs, with fibrous roots, naked 1-flowered circinate scapes, and basal tufted entire leaves, the upper surface covered with a viscid secretion to which insects adhere, and are captured by the involution of the sensitive leaf-margins. Calyx 4–5-parted, or 2-lipped, the lower lip 3-parted, the upper 2-parted. Corolla 2-lipped, the upper lip 2-cleft, the lower 3-cleft; base of the corolla saccate and contracted into a nectariferous spur. Capsule 2-valved or 4-valved. Seeds oblong, wrinkled or reticulated. [Latin, *pinguis*, fat, the leaves seeming greasy to the touch.]

About 30 species, of wide geographic distribution, chiefly in temperate and cold regions. Besides the following, 4 others are found in the southern United States.

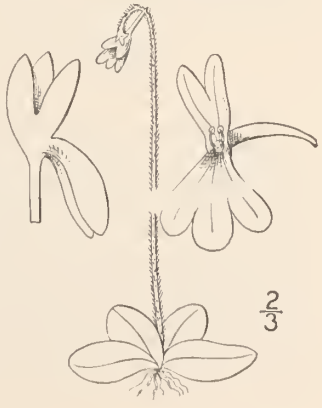
Scapes villous, 1′–2′ high; leaves oval, 3″–6″ long. 1. *P. villosa.*
Scapes glabrous or minutely downy; leaves ovate or elliptic, 1′–2′ long. 2. *P. vulgaris.*

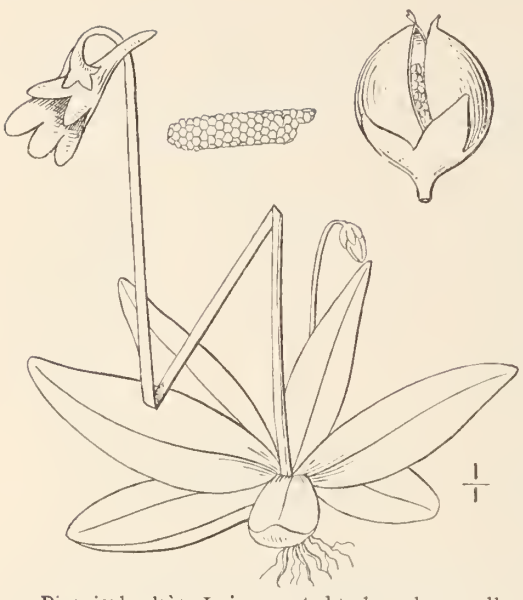
1. Pinguicula villòsa L. Hairy Butterwort. (Fig. 3356.)

Pinguicula villosa L. Sp. Pl. 17. 1753.
Pinguicula acutifolia Michx. Fl. Bor. Am. 1: 11. 1803.

Scapes slender, villous, 1′–2′ high. Leaves 3 or 4, oval, obtuse, 3″–6″ long, 2″–3″ wide, sessile, or petioled; petioles short, villous; flowers ′ broad; corolla pale violet with a yellowish-striped throa 2-lipped, the upper lip 2-parted, th c ower arger, 3-parted, the tube abruptly contracted into a straight linear or oblong blunt spur 1½″–2″ long.

Labrador and Hudson Bay to Alaska. Also in Greenland. Summer.





2 Pinguicula vulgàris L. Butterwort. Bog or Marsh Violet. (Fig. 3357.)

Pinguicula vulgaris L. Sp. Pl. 17. 1753.

Scapes glabrous, or minutely puberulent, 2′–6′ high. Leaves 3–7 in a rosette at the base of the scape, greasy to the touch on the upper surface, ovate to lanceolate, obtuse, 1′–2′ long, 3″–10″ wide, short-petioled, or sessile; corolla violet-purple, 3″–4″ broad when expanded, 2-lipped, the upper lip 2-lobed, the lower 3-lobed, larger, the tube gradually contracted into an acute or obtuse nearly straight spur 2″–4″ long; capsule globose ovoid, longer than the calyx.

On wet rocks or in gravelly rivulet beds, Newfoundland and Labrador to Alaska, south to Vermont, northern New York, Minnesota and British Columbia. Also in Greenland, Europe and northern Asia. Other English names are Beanweed, Yorkshire Sanicle, Sheep-root or -rot, Rot-grass, Sheep-weed, and Steep- or Earning-grass, from its use in curdling milk. July–Aug.

Pinguicula alpìna L. is reported to have been collected in Labrador but not sufficiently authenticated. It may be known by its recurved obtuse conic spur, not one-half as long as the lower lip of the corolla.

Family 29. OROBANCHÀCEAE Lindl. Nat. Syst. Ed. 2, 287. 1836.

BROOM-RAPE FAMILY.

Erect, simple or branched, brown yellowish purplish or nearly white root-parasites, the leaves reduced to alternate appressed scales, the flowers perfect, irregular (rarely cleistogamous), sessile in terminal bracted spikes, or solitary and peduncled in the axils of the scales. Calyx inferior, gamosepalous, 4–5-toothed, 4–5-cleft, or split nearly or quite to the base on one or both sides. Corolla gamopetalous, more or less oblique, the tube cylindric, or expanded above, the limb 2-lipped, 5-lobed. Stamens 4, didynamous, inserted on the tube of the corolla and alternate with its lobes, a fifth rudimentary one occasionally present; filaments slender; anthers 2-celled, the sacs parallel, equal. Ovary superior, 1-celled, the four placentae parietal; ovules numerous, anatropous; style slender; stigma discoid, 2-lobed, or sometimes 4-lobed. Capsule 1-celled, 2-valved. Seeds numerous, reticulated, wrinkled or striate; embryo minute; cotyledons scarcely differentiated.

About 11 genera and 200 species of wide geographic distribution, mostly in the northern hemisphere.

Flowers all complete and perfect.
- Calyx 2–5-toothed.
  - Calyx about equally 5-cleft; no bracts on pedicels nor calyx. — 1. *Thalesia.*
  - Calyx unequally toothed, or split on both sides; flowers bracted. — 2. *Orobanche.*
- Calyx spathe-like, split on the lower side, 3–4-toothed on the upper. — 3. *Conopholis.*

Lower flowers cleistogamous, fertile; upper complete, mostly sterile. — 4. *Leptamnium.*

1. THALÈSIA Raf. Am. Month. Mag. 2: 267. 1818.

[ANOPLANTHUS Endl. Icon. Gen. Pl. 12. *pl. 72.* 1838.]

[APHYLLON A. Gray, Man. 290. 1848.]

Glandular or viscid-pubescent simple-stemmed herbs, parasitic on the roots of various plants, with scattered scales, and long-peduncled yellowish white or violet, complete and perfect bractless flowers. Calyx campanulate or hemispheric, nearly equally 5-cleft, the lobes acute or acuminate. Corolla oblique, the tube elongated, curved, the limb slightly 2-lipped, the upper lip erect-spreading, 2-lobed, the lower spreading, 3-lobed, the lobes all nearly equal. Stamens included; anther-sacs mucronate at the base. Ovary ovoid; placentae equidistant, or contiguous in pairs; style slender, deciduous; stigma peltate, or transversely 2-lamellate. [Dedicated to Thales.]

About 3 species, natives of North America.

Stem very short; peduncles 1–4, erect; calyx-lobes lanceolate, acuminate. — 1. *T. uniflora.*

Stem erect, 2′–5′ high; peduncles several; calyx-lobes broad, acute. — 2. *T. fasciculata.*

1. Thalesia uniflòra (L.) Britton. Pale or Naked Broom-rape. One-flowered Broom-rape. Cancer-root. (Fig. 3358.)

Orobanche uniflora L. Sp. Pl. 633. 1753.
Anoplanthus uniflorus Endl. Icon. Gen. Pl. 12 *pl. 72.* 1838.
Aphyllon uniflorum T. & G.; A. Gray, Man. 290. 1848.
T. uniflora Britton, Mem. Torr. Club, 5: 298. 1894.

Stem usually less than 1′ long, nearly subterranean, bearing several ovate-oblong scales and 1–4 slender erect scape-like glandular-puberulent naked 1-flowered peduncles 3′–8′ high. Calyx campanulate, pubescent, glandular, 4″–5″ high, less than one-half the length of the corolla, its lobes as long as the tube or longer, lanceolate, acuminate; corolla white or violet, puberulent without, 8″–12″ long, the curved tube about 3 times as long as the limb, the short lobes oval or obovate, obtuse; placentae nearly equidistant; capsule ovoid, longer than the calyx.

In woods and thickets, parasitic on the roots of various herbs, Newfoundland to British Columbia, Virginia, Ohio, Texas and California. April–June.

2. Thalesia fasciculàta (Nutt.) Britton. Clustered or Yellow Cancer-root. (Fig. 3359.)

Orobanche fasciculata Nutt. Gen. 2: 59. 1818.
Anoplanthus fasciculatus Walp. Rep. 3: 480. 1844–45.
Aphyllon fasciculatum A. Gray, Syn. Fl. 2: Part 1, 312. 1878.
Thalesia fasciculata Britton, Mem. Torr. Club, 5: 298. 1894.

Stem erect, 2′–4′ high, densely glandular-pubescent, bearing several scales and 3–15 naked 1-flowered peduncles 1′–4′ long. Calyx glandular, broadly campanulate, 3″–5″ high, about one-third the length of the corolla, its lobes triangular-lanceolate or triangular-ovate, acute, equalling or shorter than the tube; corolla nearly 1′ long, purplish-yellow, puberulent without, the curved tube 3 times as long as the limb, the lobes oblong, obtuse, the limb more manifestly 2-lipped than in the preceding species; capsule ovoid to globose.

In sandy soil, parasitic on the roots of various plants, northern Indiana to the Northwest Territory and British Columbia, south to Nebraska, Arizona and California. April–Aug.

Thalesia fasciculàta lùtea (Parry) Britton, Mem. Torr. Club, 5: 298. 1894.
Phelipaea lutea Parry, Amer. Nat. 8: 214. 1874.
Aphyllon fasciculatum var. *luteum* A. Gray, Syn. Fl. 2: Part 1, 312. 1878.
Whole plant light yellow. Western Nebraska and Wyoming.

2. OROBÁNCHE L. Sp. Pl. 632. 1753.

Glaudular-pubescent, erect simple or branched, reddish yellowish violet or nearly white herbs, parasitic on the roots of various plants, with scattered scales, and spicate or racemose, complete and perfect, bracted and sometimes bracteolate flowers. Calyx split both above and below, nearly or quite to the base, the divisions 2-cleft or rarely entire, or more or less unequally 2–5-toothed. Corolla oblique, strongly 2-lipped; upper lip erect, emarginate or 2-lobed; lower lip spreading, 3-lobed. Stamens included; anther-sacs mostly mucronate at the base. Placentae equidistant, or approximate in pairs. Style slender, commonly persistent until after the dehisceuce of the capsule; stigma peltate to fuunelform, entire, or laterally 2-lamellate. [Greek, Choke-Vetch.]

About 90 species, natives of the Old World and western America, Besides the following some 6 others occur in the western parts of North America.

Calyx 4-toothed; stems mostly branched. 1. *O. ramosa.*
Calyx split on both sides; stem simple. 2. *O. minor.*
Calyx 5-cleft; stem simple. 3. *O. Ludoviciana.*

1. Orobanche ramòsa L. Hemp or Branched Broom-rape. (Fig. 3360.)

Orobanche ramosa L. Sp. Pl. 633. 1753.

Plant yellowish; stem rather slender, branched, or rarely simple, 3′–15′ high, the scales few and distant, 2″–5″ long. Spike loosely many-flowered, denser above than below, the lowest flowers short-pedicelled; bracts usually 3, the longest about equalling the calyx; calyx 4-toothed, the teeth triangular-ovate, acute, or acuminate, about as long as the tube; corolla 5″–9″ long, the tube yellow, slightly constricted above the ovary, the limb bluish.

Parasitic on the roots of hemp and tobacco, Kentucky. Adventive or naturalized from Europe. Summer.

2. Orobanche mìnor J. E. Smith. Lesser or Clover Broom-rape. Herb-bane. (Fig. 3361.)

O. minor J. E. Smith, Engl. Bot. *pl. 422.* 1797.

Plant yellowish brown; stem rather stout, simple, 4′–20′ high; lower scales numerous, ovate-oblong, the upper lanceolate, acute, scattered, 3″–10″ long. Spike dense, or the lower flowers separated, 3′–8′ long; bracts lanceolate, equalling or longer than the flowers; flowers 5″–9″ long; calyx split both above and below, each of the lateral segments 2-cleft, the teeth lanceolate-subulate; corolla-tube yellowish, scarcely constricted above the ovary, the limb bluish.

Parasitic on the roots of clover, New Jersey to Virginia. Naturalized from Europe. Called also Devil's-root and Hell-root. May–July.

3. Orobanche Ludoviciàna Nutt. Louisiana Broom-rape. (Fig. 3362.)

Orobanche Ludoviciana Nutt. Gen. 2: 58. 1818.
Aphyllon Ludovicianum A. Gray, Bot. Cal. 1: 585. 1876.

Stems stout, simple, solitary or clustered, viscid-puberulent, 4′–12′ high, scaly. Flowers 6″–8″ long, very numerous in dense terminal spikes, 1–2-bracted under the calyx; calyx 5-cleft, the lobes somewhat unequal, linear-lanceolate, acuminate, longer than the corolla-tube, or shorter; corolla 2-lipped, purplish, its tube narrow, about twice as long as the limb; anthers woolly; capsule ovoid-oblong, shorter than the calyx.

In sandy soil, Illinois to the Northwest Territory, south to Texas, Arizona and California. June–Aug.

3. CONÓPHOLIS Wallr. Orobanch. 78. 1825.

An erect stout simple glabrous, densely scaly, light brown herb, parasitic on the roots of trees, with yellowish flowers 2-bracteolate under the calyx, in a thick dense bracted spike, the

bracts similar to the scales of the stem. Calyx oblique, deeply split on the lower side, 3–4-toothed on the upper. Corolla strongly 2-lipped, the tube slightly curved, the upper lip concave, nearly erect, emarginate, the lower spreading, 3-lobed. Stamens exserted; anther-sacs bristly pubescent. Placentae about equidistant; stigma capitate, obscurely 2-lamellate. Capsule ovoid-globose. [Greek, signifying a scaly cone.]

Two known species, one of eastern North America, the other Mexican.

1. Conopholis Americàna (L. f.) Wallr. Squaw-root. (Fig. 3363.)

Orobanche Americana L. f. Suppl. 88. 1767.
Conopholis Americana Wallr. Orobanch. 78. 1825.

Plants 3′–10′ high from a thickened base, light brown, usually clustered, covered all over with stiff imbricated scales. Upper scales lanceolate or ovate, acute, 6″–10″ long, the lowest much shorter; flowers about ½′ long, exceedingly numerous in the dense spike which is 6″–10″ thick; corolla pale yellow, somewhat exceeding the calyx; anthers sagittate; capsule ovoid-globose, 4″–5″ high.

In rich woods at bases of trees (Canada?); Maine to Michigan, south to Florida. Called also Cancer-root and Earth Club. April–Aug.

4. LEPTÁMNIUM Raf. Am. Month. Mag. 2: 267. Feb. 1818.

[EPIFAGUS Nutt. Gen. 2: 60. 1818.]

An erect slender glabrous, purplish or yellowish, rather stiff branching herb, parasitic on the roots of the beech, with few small scattered scales, and sessile dimorphous flowers, distantly spicate on the branches, the lower cleistogamous, abundantly fertile, the upper complete but mostly sterile. Calyx short, nearly equally 5-toothed. Corolla of the upper flowers cylindric, slightly flattened laterally, the tube much longer than the 4-lobed limb, the upper lobe concave, larger than the 3 lower ones; stamens not exserted; anther-sacs mucronulate at the base; style filiform, 2-lobed; ovary with an adnate gland on the upper side near the base. Corolla of the lower flowers minute, not unfolding, borne like a hood on the summit of the ovoid ovary; style very short; placentae contiguous in pairs; capsule at length 2-valved at the summit. [Greek, referring to the small calyx.]

A monotypic genus of eastern North America.

1. Leptamnium Virginiànum (L.) Raf. Beech-drops. (Fig. 3364.)

Orobanche Virginiana L. Sp. Pl. 633. 1753.
Epifagus Americana Nutt. Gen. 2: 60. 1818.
Epiphegus Virginiana Bart. Comp. Fl. Phil. 2: 50. 1818.
Leptamnium Virginianum Raf.; A. Gray, Syn. Fl. 2: Part 1, 314. 1878. As synonym.

Plant 6′–2° high from a thick scaly base, the roots brittle, fibrous. Stem paniculately branched, the branches straight, ascending; scales very few and small; corolla of the upper flowers 4″–5″ long and 1″ thick, striped with purple and white, the limb not at all spreading; stamens about as long as the corolla; style slightly exserted; lower flowers 1½″ long, the corolla resembling the calyptra of a moss; capsule 3″ high, somewhat oblique and compressed, many-seeded.

In beech woods, New Brunswick to Florida, west to Ontario, Michigan, Missouri and Louisiana. Called also Cancer-root. Aug.-Oct.

Family 30. BIGNONIÀCEAE Pers. Syn. 2: 168. 1807.

Trumpet-creeper Family.

Trees, shrubs or woody vines, a few exotic species herbs, with opposite (rarely alternate) compound or simple leaves, and mostly large and showy, clustered terminal or axillary, more or less irregular flowers. Calyx inferior, gamosepalous. Corolla gamopetalous, funnelform, campanulate, or tubular, 5-lobed, somewhat 2-lipped, at least in the bud. Anther-bearing stamens 2 or 4, inserted on the tube of the corolla and alternate with its lobes; anthers 2-celled, the sacs longitudinally dehiscent. Disk annular or cup-like. Ovary sessile or stalked, mostly 2-celled; placentae parietal, or on the partition-wall of the ovary; ovules very numerous, horizontal, anatropous; style slender; stigma terminal, 2-lobed. Capsule 2-valved, loculicidally, septifragally or septicidally dehiscent. Seeds flat, transverse, winged in our genera; endosperm none; cotyledons broad and flat, emarginate or 2-lobed; radicle short, straight.

About 60 genera and 500 species of wide geographic distribution in tropical regions, a few in the north and south temperate zones.

Leaves compound; anther-bearing stamens 4; our species vines.
- Calyx-limb undulate; capsule flattened parallel with its partition-wall. 1. *Bignonia.*
- Calyx 5-toothed; capsule compressed at right angles to its partition-wall. 2. *Tecoma.*

Leaves simple; anther-bearing stamens mostly 2; trees. 3. *Catalpa.*

1. BIGNÒNIA L. Sp. Pl. 633. 1753.

Woody vines, with opposite 2–3-foliolate leaves, the terminal leaflet usually reduced to a teudril (some tropical species with decompound or even simple leaves), and large flowers in axillary cymes or terminal panicles. Calyx campanulate, the limb merely undulate, truncate or slightly 5-toothed. Tube of the corolla much expanded above the calyx, the limb somewhat 2-lipped, 5-lobed, the lobes rounded. Anther-bearing stamens 4, didynamous, included, inserted near the base of the corolla; anther-sacs glabrous, divergent. Capsule linear, flattened parallel with the thin partition, septifragally dehiscent, the margins of the valves more or less thickened. Seeds in 1 or 2 rows on both margins of the partition, winged, much broader than high, the wing entire, or erose at the end. [Named after the Abbe Bignon, 1662–1743, librarian to Louis XV.]

About 150 species, natives of America. The following is the only one known in the United States.

1. Bignonia crucígera L. Tendrilled Trumpet-flower. Cross-vine. (Fig. 3365.)

Bignonia crucigera L. Sp. Pl. 624. 1753.
Bignonia capreolata L. loc. cit. 1753.

A glabrous woody vine, often climbing to the height of 40°–60°, the stems sometimes 4′ in diameter, exhibiting a conspicuous cross in the transverse section. Leaves petioled, commonly with small simple stipule-like ones in their axils, 2-foliolate, terminated by a branched teudril; leaflets stalked, oblong or ovate, entire, acute or acuminate at the apex, cordate at the base, pinnately veined, 3′–7′ long; cymes numerous, short-peduncled, 2–5-flowered; pedicels 1′–2′ long; calyx membranous; corolla 2′ long, orange and puberulent without, yellow within; capsule 5′–7′ long, 8″–10″ broad, very flat, each valve longitudinally 1-nerved; seeds broadly winged laterally, narrowly winged above and below, 1½′ broad.

In moist woods, Virginia to Florida and Louisiana, north to Ohio and southern Illinois. Called also Quarter Vine. April–June.

2. TECÒMA Juss. Gen. 139. 1789.

Climbing woody vines with aerial rootlets, or erect shrubs, with opposite pinnately compound or sometimes simple leaves, and large showy red or orange flowers, in terminal corymbs, racemes, or panicles. Calyx tubular-campanulate, somewhat unequally 5-toothed. Corolla-tube elongated, enlarged above the calyx, narrowly campanulate, the limb slightly 2-lipped, 5-lobed, the lobes spreading. Anther-bearing stamens 4, didynamous, ascending under the upper lip; anther-sacs divergent, glabrous or slightly pubescent. Capsule elongated, slightly compressed at right angles to the partition, loculicidally and septicidally dehiscent. Seeds in 1, 2 or several rows on each side of the margins of the partition, winged, the wing translucent. [From the Aztec name Tecomaxochitl.]

About 80 species, natives of warm and temperate regions of both the Old World and the New. Besides the following, another occurs in the southern United States.

1. Tecoma radicans (L.) DC. Trumpet-flower. Trumpet-creeper. (Fig. 3366.)

Bignonia radicans L. Sp. Pl. 624. 1753.
Tecoma radicans DC. Prodr. 9: 223. 1845.

A woody vine, climbing to the height of 20°–40°, or prostrate if meeting no support. Leaves petioled, odd-pinnate, not tendril-bearing, 8′–15′ long; leaflets 7–11, ovate to lanceolate, short-stalked, sharply serrate, reticulate-veined, glabrous, or pubescent on the veins beneath, acute or acuminate at the apex, narrowed at the base, 1½′–3′ long; flowers corymbose, short-pedicelled; corymbs 2–9-flowered; calyx coriaceous, about 1′ long; corolla scarlet, 2½′ long, the tube veined within, 3 times as long as the limb; anther-sacs glabrous; stigma spatulate; capsule stalked, 4′–6′ long, 10″ in diameter, narrowed at both ends, little flattened, ridged above and below by the margins of the valves: seeds in several rows on each surface of the partition, broadly winged laterally, the wing eroded.

In moist woods and thickets, southern New Jersey and Pennsylvania to Florida and Texas, north to Illinois. Escaped from cultivation further north. Called also Trumpet-vine and Trumpet-Ash. Aug.–Sept.

1. CATÁLPA Scop. Introd. 170. 1771.

Trees, or some exotic species shrubs, with opposite or rarely verticillate simple petioled leaves, and large showy white or mottled flowers in terminal panicles or corymbs. Calyx closed in the bud, splitting irregularly or into 2 lips in opening. Corolla-tube campanulate or obconic, oblique, expanded above, 2-lipped, 5-lobed, the lobes all spreading, their margins crisped. Anther-bearing stamens 2, ascending under the upper lip of the corolla; anther-sacs glabrous, linear or oblong, divergent; sterile stamens (staminodia) 3, short (or occasionally 4 perfect didynamous stamens and 1 staminodium). Disk obsolete. Ovary sessile, 2-celled; ovules in 2-several rows on the sides of the partition. Capsule elongated-linear, terete, loculicidally dehiscent. Seeds flat, the large lateral wings dissected into capillary processes. [The American Indian name of the first species below.]

About 7 species, the following in eastern North America, 2 in eastern Asia, 2 or 3 in the West Indies.

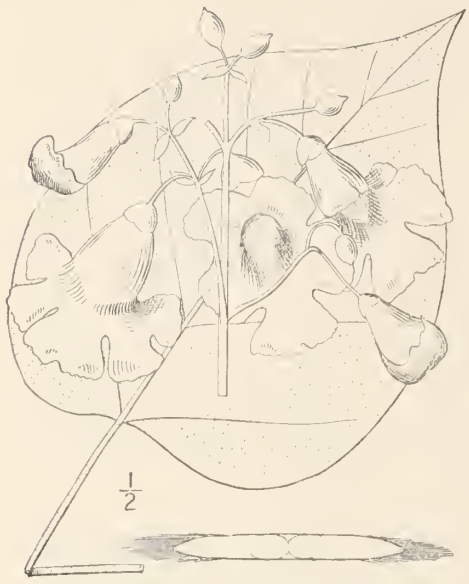
Corolla thickly spotted within, 1′–1½′ long, the lower lobe entire. 1. *C. Catalpa*
Corolla little spotted, 2′ long, the lower lobe emarginate. 2. *C. speciosa.*

1. Catalpa Catálpa (L.) Karst. Catalpa. Indian Bean. Candle-tree. Bean-tree. (Fig. 3367.)

Bignonia Catalpa L. Sp. Pl. 622. 1753.
Catalpa bignonioides Walt. Fl. Car. 64. 1788.
Catalpa Catalpa Karst. Deutsch. Fl. 927. 1880–83.

A tree, with thin flaky bark, reaching a maximum height of about 60° and a trunk diameter of 4°, the branches spreading. Leaves strong-scented, broadly ovate, entire, or 3-lobed, acute or acuminate at the apex, densely pubescent beneath, becoming glabrous above, obtuse at the base, 6′–12′ long, the lobes, when present, acuminate; petioles stout, nearly as long as the blade; flowers white, numerous, mottled with yellow and purple within, 1′–1½′ long, in large terminal erect panicles; corolla-tube campanulate, the lower lobe entire; capsules 10′–13′ long, 4″–5″ thick, thin-walled, drooping.

In woods in the Gulf States. Escaped from cultivation northward as far as Pennsylvania and southern New York. Wood brown, soft, weak, durable in contact with the soil. Weight per cubic foot 28 lbs. June-July.



2. Catalpa speciòsa Warder. Catawba Tree. Larger Indian Bean. (Fig. 3368.)

Catalpa speciosa Warder; Engelm. Coult. Bot. Gaz. 5: 1. 1880.
Catalpa cordifolia Duham. Nouveau, 2: *pl. 5.* 1802. Not Moench, 1794.

A tree, with thick rough bark, reaching a maximum height of 120° and a diameter trunk of 4½°, similar to the preceding species. Leaves not unpleasantly scented, broadly ovate, commonly entire, long-acuminate at the apex; panicles few-flowered; corolla faintly mottled within, the tube obconic, the limb only slightly oblique, the lower lobe emarginate; capsule thick-walled, 10′–20′ long, nearly 10″ in diameter.

In woods, southern Illinois to Tennessee, west to Missouri and Arkansas. Wood brown, soft, weak, durable. Weight per cubic foot 26 lbs. May-June.

Family 31. MARTYNIÀCEAE Link, Handb. 1: 504. 1829.

Unicorn-plant Family.

Herbs, with opposite leaves, or the upper sometimes alternate, and perfect irregular flowers, racemose in our species. Calyx inferior, 4–5-cleft or 4–5-parted or sometimes split to the base on the lower side. Corolla gamopetalous, irregular, the tube oblique, often decurved, the limb slightly 2-lipped, 5-lobed, the lobes nearly equal, the 2 upper ones exterior in the bud. Anther-bearing stamens 4, didynamous, or the posterior pair sterile; anthers 2-celled, the sacs longitudinally dehiscent. Ovary 1-celled, with 2 parietal placentae expanded into broad surfaces, or 2–4-celled by the intrusion of the placentae or by false partitions; ovules numerous or few in each cavity of the ovary, anatropous; style slender; stigma 2-lobed or 2-lamellate. Fruit various in the different genera. Seeds oblong or orbicular, compressed, wingless or narrowly winged; endosperm none; embryo large; cotyledons fleshy, flat; radicle short and straight.

Three genera and 10 species, mainly tropical.

1. MARTÝNIA L. Sp. Pl. 618. 1753.

Coarse diffusely branched glandular-pubescent and viscid strong-scented herbs, with opposite or alternate long-petioled leaves, and large violet purple whitish or mottled flowers in short terminal racemes. Calyx 1–2-bracteolate at the base, campanulate, inflated, unequally 5-cleft, deciduous. Corolla funnelform-campanulate, oblique, decurved, the 5 lobes nearly equal, spreading. Stamens 4 in our species; anthers gland-tipped, their sacs divergent. Ovary 1-celled, the 2 parietal placentae intruded and expanded in the center of the cavity into broad surfaces bearing the ovules in 1 or 2 rows. Fruit an incurved beaked loculicidally 2-valved capsule, the exocarp somewhat fleshy, the endocarp fibrous, woody, crested below or also above, 4-celled by the extension of the placentae. Seeds numerous, tuberculate. [Named for John Martyn, 1693–1768, professor of botany at Cambridge, England.]

About 8 species, natives of America. Besides the following, 2 others occur in the southwestern United States.

1. Martynia Louisiàna Mill. Unicorn-Plant. Elephant's Trunk. Double-claw. (Fig. 3369.)

M. Louisiana Mill. Gard. Dict. Ed. 8, no. 3. 1768.
Martynia proboscidea Glox. Obs. 14. 1785.

Annual, densely glandular-pubescent all over; stem stout, much branched, the branches prostrate or ascending, 1°–3° long. Leaves broadly ovate to orbicular, rounded at the apex, cordate at the base, repand, undulate or entire, 3′–12′ in diameter, the petiole stout, mostly longer than the blade; bractlets at the base of the calyx oblong or linear, deciduous; calyx somewhat cleft on the lower side; racemes several-flowered; pedicels slender; corolla whitish or yellowish, mottled with purple or yellow within, 1½′–2′ long, the limb nearly as broad, the lobes obtuse; stamens all anther-bearing; fruit strongly curved, 4′–6′ long when mature, the beak longer than the body, splitting into 2 elastically diverging segments, the endocarp crested on the under side only.

In waste places, escaped from gardens, Maine to New Jersey and North Carolina. Native in the Mississippi Valley from Iowa and Illinois southward. July–Sept.

Family 32. ACANTHÀCEAE J. St. Hil. Expos. Fam. 1: 236. 1805.

ACANTHUS FAMILY.

Herbs, or some tropical genera shrubs or small trees, with opposite simple exstipulate leaves, and irregular or nearly regular perfect flowers. Calyx inferior, persistent, 4–5-parted or 4–5-cleft, the sepals or segments imbricated, equal or unequal. Corolla gamopetalous, nearly regularly 5-lobed with the lobes convolute in the bud, or conspicuously 2-lipped. Anther-bearing stamens 4, didynamous, or 2 only; anthers mostly 2-celled, the sacs longitudinally dehiscent. Disk annular, or cup-like. Ovary 2-celled; ovules 2–10 in each cavity, anatropous or amphitropous; style filiform, simple; stigmas 1 or 2. Capsule dry, 2-celled, loculicidally elastically 2-valved. Seeds globose or orbicular, not winged, borne on curved projections (retinacula) from the placentae, the testa close, mostly roughened, often developing spiral threads and mucilage when wetted. Endosperm in the following genera none; cotyledons flat, commonly cordate.

About 175 genera and 1800 species, natives of temperate and tropical regions of the Old World and the New.

Corolla convolute in the bud, nearly regular; stamens 4.
- Ovules 2 in each cavity; capsule 2–4-seeded. 1. *Calophanes.*
- Ovules 3–10 in each cavity; capsule 6–20-seeded. 2. *Ruellia.*

Corolla imbricated in the bud, strongly 2-lipped; stamens 2.
- Lower lip of the corolla 3-cleft; flowers bracted not involucrate. 3. *Dianthera.*
- Lower lip of the corolla entire or 3-toothed; flowers involucrate. 4. *Diapedium.*

1. CALÓPHANES Don; Sweet, Brit. Fl. Gard. (II). *pl. 181.* 1833.

Erect or procumbent perennial herbs or shrubs, with entire leaves (smaller ones sometimes fascicled in their axils), and blue or purple, rather large, bracted flowers, axillary, solitary or clustered. Calyx deeply 5-cleft, the lobes setaceous. Corolla funnelform, the tube slightly curved, enlarged above, or cylindraceous, the limb spreading, 5-lobed, somewhat 2-lipped, the lobes rounded, sinistrorsely convolute in the bud. Stamens 4, didynamous, included, all anther-bearing in our species; anther-sacs mucronate at the base. Ovules 2 in each cell of the ovary; summit of the style recurved; stigma simple, or of 2 unequal lobes. Capsule oblong, linear, narrowed at the base, 2–4-seeded. Seeds flat, orbicular, attached by their edges to the retinacula. [Greek, beautiful appearance.]

About 30 species, of wide distribution in warm and tropical regions. Besides the following, 4 others occur in the southern and southwestern United States.

1. Calophanes oblongifòlia (Michx.) Don. Calophanes. (Fig. 3370.)

Ruellia biflora L. Sp. Pl. 635. 1753.?
R. oblongifolia Michx. Fl. Bor. Am. 2: 23. 1803.
Calophanes oblongifolia Don; Sweet, Brit. Fl. Gard. (II) *pl. 181.* 1833.
Dipteracanthus biflorus Nees, Linnaea, 16: 294. 1842.

Rootstocks horizontal, slender. Stems slender, erect, simple, or branched below, pubescent or puberulent, obtusely 4-angled, 6′–15′ high, rather stiff. Leaves ascending or erect, oblong or oval, rounded at the apex, somewhat narrowed at the base, very short-petioled, or sessile, pubescent or glabrate, 8″–15″ long; flowers commonly solitary in the axils; calyx-segments filiform, hirsute, exceeding the oblong obtuse bractlets; corolla blue, or mottled with purple, 8″–12″ long, slightly 2-lipped, its tube enlarged above; capsule oblong, about one-half the length of the calyx; anther-sacs mucronate-aristate at the base.

In sandy pine barrens, Virginia to Florida, mainly near the coast. June–Sept.

2. RUÉLLIA L. Sp. Pl. 634. 1753.

Perennial herbs, or shrubs, mostly pubescent, with entire or rarely deutate leaves, and large violet blue white or yellow flowers, solitary or clustered in the axils, or cymose in terminal panicles. Calyx 5-cleft, or 5-parted, the segments narrow. Corolla funnelform or salverform, the tube usually narrow, slightly enlarged above, the limb spreading, 5-lobed, the lobes obtuse, mostly nearly equal, sinistrorsely convolute in the bud. Stamens 4, included or exserted; anther-sacs not mucronate at the base. Ovules 3–10 in each cavity of the ovary; apex of the style recurved; stigma simple, or of 2 unequal lobes. Capsule oblong or club-shaped, compressed or terete, 6-20-seeded. Seeds compressed, ovate or orbicular, attached by their edges to the retiuacula. [Named for I. Ruel or de la Ruelle, 1474–1537, an early French herbalist.]

About 200 species, mainly of tropical America, a few in Africa, Asia and Australia. Besides the following, some 5 others occur in the southern and southwestern United States.

Flowers sessile or nearly so.
Calyx-segments linear-lanceolate, scarcely exceeding the capsule. 1. *R. strepens.*
Calyx-segments filiform-linear, much exceeding the capsule. 2. *R. ciliosa.*
Flowers peduncled; peduncle with two large bracts at the summit. 3. *R. pedunculata.*

1. Ruellia strèpens L. Smooth Ruellia. (Fig. 3371.)

Ruellia strepens L. Sp. Pl. 634. 1753.

Glabrate, or somewhat pubescent; stem erect, slender, simple, or branched, 4-sided, 1°–4° high, the branches ascending. Leaves oblong, oval, or ovate, petioled, acute or subacute at the apex, narrowed at the base, 3′–6′ long; petioles 2″–10″ loug; flowers solitary or several together in the axils; calyx-segments linear-lanceolate, shorter than the corolla-tube, slightly pubescent or ciliate, 8″–12″ long, ½″–1″ wide; corolla blue, 1½′–2′ long, the limb nearly as broad, the tube about as long as the throat and limb; capsule club-shaped, longer than or equalliug the calyx.

In dry woods, Pennsylvania to Wisconsin, south to Florida and Texas. May–July.

Ruellia strèpens micrántha (Engelm. & Gray) Britton.
Dipteracanthus micranthus Engelm. & Gray, Bost. Journ. Nat. Hist. 5: 257. 1845.
Ruellia strepens var. *cleistantha* A. Gray, Syn. Fl. 2: Part 1, 327. 1878.

Flowers mostly eleistogamous; leaves often narrower. Range of the type.

2. Ruellia ciliòsa Pursh. Hairy Ruellia. (Fig. 3372.)

Ruellia ciliosa Pursh, Fl. Am. Sept. 420. 1814.

Similar to the preceding species, but hirsute or pubescent, at least above; stem erect, or ascending, rather stout, 1°–2½° high. Leaves hairy, ciliate oblong, oval, or ovate, sessile or short-petioled, obtuse or subacute at the apex, narrowed at the base, 1½′–3′ long; flowers clustered or solitary in the axils, sometimes cleistogamous; calyx-segments filiform, hirsute, 10″–12″ long, about ¼″ wide; corolla blue, 1½′–2′ long, the tube equalling or longer than the obconic throat and nearly regular limb; capsule shorter than the calyx.

In dry soil, southern New Jersey and Pennsylvania, to Florida, west to Michigan, Nebraska and Louisiana. Perhaps includes several species. June–Sept.

Ruellia ciliòsa parviflòra (Nees) Britton.

Dipteracanthus ciliosus var. *parviflorus* Nees, Linnaea, 16: 294. 1842.

Ruellia ciliosa var *ambigua* A. Gray, Syn. Fl. 2: Part 1, 326. 1878.

Glabrous or nearly so throughout, or the calyx pubescent; leaves often manifestly petioled. Virginia to Alabama.

3. Ruellia pedunculàta Torr. Stalked Ruellia. (Fig. 3373.)

Ruellia pedunculata Torr.; A. Gray, Syn. Fl. 2: Part 1, 326. 1878.

Finely pubescent; stem erect, 1°–2½° tall, the branches spreading. Leaves ovate to oblong-lanceolate, acute or acuminate at the apex, narrowed at the base, short-petioled, the larger 2′–3′ long; peduncles slender, spreading, 1′–3′ long, with 2 leaf-like bracts at the summit which subtend a solitary flower, or 2 or 3 slender-pedicelled ones with pedicels similarly bracted; calyx-segments awn-like, equalling the narrow corolla-tube, or shorter; corolla funnelform, 1½′–2′ long; capsule about 10″ long, puberulent, longer than the calyx.

In dry soil, Missouri to Arkansas and Louisiana. June–Sept.

3. DIANTHÈRA L. Sp. Pl. 27. 1753.

Herbs, mostly perennial, with entire or rarely dentate leaves, and small or large very irregular flowers, variously clustered or solitary in the axils. Calyx deeply 4–5-parted, the segments narrow. Corolla-tube slender, short or elongated, curved or nearly straight, the limb conspicuously 2-lipped; upper lip interior in the bud, erect or ascending, concave, entire, or 2-dentate; lower lip spreading, 3-cleft. Stamens 2, inserted on the throat of the corolla, not exceeding the upper lip; anther-sacs ovate or oblong, slightly divergent, not mucronate, separated by a rather broad connective. Ovules 2 in each cavity of the ovary; style slender; stigma entire, or 2-lobed. Capsule contracted at the base into a long stipe, about 4-seeded. Seeds flat, orbicular or ovate, the placentae not separating from the walls of the capsule. [Greek, double anthers.]

About 100 species, native of tropical America, a few in tropical Asia and Africa. Besides the following, 4 others occur in the southern and southwestern United States.

Flowers capitate, the heads dense, at length oblong. 1. *D. Americana.*
Flowers in loose spikes. 2. *D. ovata.*

1. Dianthera Americàna L.
Dense-flowered Water Willow.
(Fig. 3374.)

Dianthera Americana L. Sp. Pl. 27. 1753.

Perennial, glabrous; stem erect, grooved and angled, slender, usually simple, 1°–3° high. Leaves lanceolate or linear-lanceolate, gradually acuminate, 3′–6′ long, 3″–8″ wide, entire, narrowed at the base into short petioles, or sessile; flowers violet, or nearly white, capitate-spicate at the ends of slender axillary peduncles which are shorter than or equal the leaves; bractlets linear-subulate, shorter than the flowers; corolla 5″–6″ long, its tube shorter than the lips, the base of the lower lip rough and palate-like; capsule 6″ long, exceeding the calyx, its stipe about the length of the slightly compressed body.

In water and wet places, Ontario and Michigan to Georgia and Texas. May–Aug.

2. Dianthera ovàta Walt. Loose-flowered Water Willow. (Fig. 3375.)

Dianthera ovata Walt. Fl. Car. 63. 1788.

Dianthera humilis Engelm. & Gray, Bost. Journ. Nat. Hist. 5: 230. Name only. 1845.

Perennial, glabrous; stem ascending or erect from a horizontal base, slender, 6′–20′ high, simple, or sparingly branched. Leaves short-petioled, or sessile, ovate, oblong, oval, lanceolate, or linear, 1′–3′ long, 2″–18″ wide; flowers in loose slender-peduncled axillary spikes, which become 1′–3′ long; peduncles shorter than or but little exceeding the leaves; calyx-segments narrowly linear, much longer than the bracts and bractlets; corolla pale purple, 4″–5″ long; capsule about 6″ long.

In wet soil, especially along streams, southern Virginia to Florida, west to Arkansas and Texas. June–Aug.

4. DIAPÈDIUM Konig; Konig & Sims, Ann. Bot. 2: 189. 1806.

[Dicliptera Juss. Ann. Mus. Paris, 9: 267. 1807.]

Erect or diffuse branched pubescent or glabrous herbs, with entire petioled leaves, and blue red or violet flowers, subtended by involucres of 2–4 distinct or connate bracts, the inflorescence mostly cymose or spicate, the involucres subtending 1 flower or several. Calyx 4–5-cleft, the lobes linear or subulate. Corolla-tube slender, slightly enlarged above, the limb conspicuously 2-lipped; upper lip erect, concave, interior in the bud, entire or 2–3-toothed; lower lip spreading, entire or 3-toothed. Stamens 2; anther-sacs parallel, sometimes unequal, separated by a narrow connective. Style filiform; ovules 2 in each cavity of the ovary. Capsule flattened, ovate or suborbicular, sessile or stipitate, 2–4-seeded. Placentae separating elastically from the walls of the capsule. Seeds compressed, nearly orbicular.

About 60 species, natives of warm and tropical regions. Besides the following, 4 others occur in the southern and southwestern United States.

1. **Diapedium brachiàtum** (Pursh) Kuntze. Diapedium. (Fig. 3376.)

Justicia brachiata Pursh, Fl. Am. Sept. 13. 1814.
Dicliptera brachiata Spreng. Syst. 1: 86. 1825.
Diapedium brachiatum Kuntze, Rev. Gen. Pl. 485. 1891.

Annual (?), glabrate, or pubescent; stem slender, 6-grooved, erect, much branched, 1°–2° high. Leaves ovate, membranous, long-petioled, acuminate or acute at the apex, narrowed or rounded at the base, 3′–6′ long, 1′–3′ wide; inflorescence paniculate, the involucres 1–4-flowered, each of 2 oblong or obovate, obtuse or mucronate, opposite bracts; corolla 8″–12″ long, pink or purple, the lips about as long as the slender tube; upper lip 2–3-toothed, the lower entire; capsule oblong, 2″–3″ high, a little longer than the involucre, the valves slightly divergent in dehiscence, the placentae curving upward and remaining attached to their summits.

In moist thickets, Kansas (according to Smyth); Indian Territory to Texas, Florida and North Carolina. July-Oct.

Family 32. **PHRYMÀCEAE** Schauer in DC. Prodr. 11: 520. 1847.

LOPSEED FAMILY.

An erect perennial herb with divaricate branches, opposite membranous simple leaves, and small irregular purplish flowers, distant in slender elongated spikes. Calyx cylindric, 2-lipped; upper lip 2-cleft, the teeth setaceous; lower lip much shorter, 3-toothed, the teeth subulate. Corolla-tube cylindric, the limb 2-lipped; upper lip erect, concave, emarginate; lower lip larger, spreading, convex, 3-lobed, the lobes obtuse. Stamens 4, didynamous, included. Ovary oblique, 1-celled; ovule 1, orthotropous, ascending; style slender; stigma 2-lobed. Calyx reflexed in fruit, enclosing the dry achene, becoming prominently ribbed, closed and its teeth hooked at the ends. Cotyledons convolute; radicle superior.

Consists of the following:

1. **PHRÝMA** L. Sp. Pl. 601. 1753.

A monotypic genus of eastern North America, eastern and central Asia.

1. **Phryma Leptostàchya** L. Lopseed. (Fig. 3377.)

Phryma Leptostachya L. Sp. Pl. 601. 1753.

Puberulent; stem somewhat 4-sided, sometimes constricted above the nodes, branched above, the branches slender, elongated, divergent. Leaves ovate, acute or acuminate at the apex, obtuse or narrowed at the base, very thin, coarsely dentate, 2′–6′ long, the lower petioled, the upper often nearly sessile; spikes very narrow, 3′–6′ long; flowers about 3″ long, mostly opposite, distant, borne on very short minutely 2-bracteolate pedicels, at first erect, soon spreading, the calyx, after flowering, abruptly reflexed against the axis of the spike.

In woods and thickets, Canada to Minnesota, south to Florida and Kansas. June-Aug.

Family 33. **PLANTAGINÀCEAE** Lindl. Nat. Syst. Ed. 2, 267. 1836.

PLANTAIN FAMILY.

Annual or perennial, mostly acaulescent or short-stemmed, rarely stoloniferous herbs, with basal, or, in the caulescent species, opposite or alternate leaves, and small perfect polygamous or monoecious flowers, bracteolate in dense terminal, long-scaped spikes or heads, or rarely solitary. Calyx 4-parted, inferior, persistent, the segments imbricated. Corolla hypogynous, scarious or mem-

branous, mostly marcescent, 4-lobed. Stamens 4 or 2 (only 1 in an Andean genus), inserted on the tube or throat of the corolla; filaments filiform, exserted or included; anthers versatile, 2-celled, the sacs longitudinally dehiscent. Ovary sessile, superior, 1–2-celled, or falsely 3–4-celled. Style filiform, simple, mostly longitudinally stigmatic. Ovules 1–several in each cavity of the ovary, peltate, amphitropous. Fruit a pyxis, circumscissile at or below the middle, or an indehiscent nutlet. Seeds 1–several in each cavity of the fruit; endosperm fleshy; cotyledons narrow; radicle short, mostly straight.

Three genera and over 200 species, of wide geographic distribution.

Flowers in terminal spikes or heads; fruit a pyxis. 1. *Plantago.*

Flowers monoecious, the staminate solitary, peduncled, the pistillate sessile among the linear leaves; fruit indehiscent. 2. *Littorella.*

1. PLANTAGO L. Sp. Pl. 112. 1753.

Acaulescent or short-stemmed herbs, the scapes arising from the axils of the basal or alternate leaves, bearing terminal spikes or heads of small greenish or purplish flowers (flowers solitary in a few exotic species). Calyx-segments equal, or two of them larger. Corolla salverform, the tube cylindric, or constricted at the throat, the limb spreading in anthesis, erect, spreading or reflexed in fruit, 4-lobed or 4-parted. Stamens 4 or 2. Ovary 2-celled, or falsely 3–4-celled; ovules 1–several in each cavity. Fruit a membranous pyxis, mostly 2-celled. Seeds various, sometimes hollowed out on the inner side. [The Latin name.]

Over 200 species, of wide geographic distribution. Besides the following, some 6 others occur in the western and southwestern parts of North America. Known as Plantain, Ribwort or Road-weed.

* Stem acaulescent; flowers spicate or capitate at the ends of scapes.

Corolla-lobes spreading or reflexed in fruit, not closed over the top of the pyxis.

Leaves ovate, lanceolate or oblong.

Seeds several or many in each pyxis.

Pyxis ovoid, circumscissile at about the middle. 1. *P. major.*

Pyxis oblong, circumscissile much below the middle. 2. *P. Rugelii.*

Seeds 2–4 in each pyxis.

Leaves all narrowed at the base, parallel-ribbed.

Seeds excavated on the inner side. 3. *P. lanceolata.*

Seeds flat or but slightly concave on the inner side.

Capsule equalling or a little longer than the calyx.

Spike very dense; leaves pubescent. 4. *P. media.*

Lower flowers scattered; leaves glabrous or very nearly so. 5. *P. eriopoda.*

Capsule twice as long as the calyx. 6. *P. sparsiflora.*

Leaves, or some of them, cordate; veins starting from the midrib. 7. *P. cordata.*

Leaves linear or filiform.

Leaves fleshy; plant maritime. 8. *P. maritima.*

Leaves not fleshy; plants not maritime.

Spike densely tomentose; bracts usually not longer than calyx. 9. *P. Purshii.*

Plant green and glabrate; bracts much longer than the calyx. 10. *P. aristata.*

Corolla-lobes erect and closed over the top of the pyxis.

Leaves spatulate to obovate; stamens 4. 11. *P. Virginica.*

Leaves linear-filiform; stamens 2.

Capsule about 4-seeded, slightly exceeding the calyx. 12. *P. elongata.*

Capsule 8–20-seeded, twice as long as the calyx. 13. *P. heterophylla.*

* * Stem erect, leafy; flowers capitate at the ends of axillary peduncles. 14. *P. arenaria.*

1. Plantago major L. Common, or Greater Plantain. (Fig. 3378.)

Plantago major L. Sp. Pl. 112. 1753.

Perennial, glabrous or somewhat pubescent; rootstock short, thick, erect; scapes longer than the leaves. Leaves spreading or ascending, long-petioled, mostly ovate, obtuse or acutish, narrowed, rounded or cordate at the base, entire, or coarsely dentate, 1′–10′ long, 3–11-ribbed; scapes 2′–3° high; spike linear-cylindric, usually very dense, commonly blunt at the summit, 2′–10′ long, 3″–4″ thick; flowers perfect, proterogynous; sepals broadly ovate to obovate, scarious on the margins, one-half to two-thirds as long as the ovoid obtuse or subacute, 5–16-seeded pyxis, which is circumscissile at about the middle; corolla-lobes spreading or reflexed on the summit of the pyxis; stamens 4.

In waste places, nearly throughout North America. Naturalized from Europe, or perhaps indigenous in the far North and on salt meadows. Small leaves are occasionally borne near the bases of the spikes, and the spikes are rarely branched. The salt meadow plant may be distinct. May–Sept. Old names, Bird-seed, Broad-leaf, Hen-plant, Lamb's-foot, Waybread, Healing-blade, Dooryard Plantain.

2. Plantago Rugèlii Dec. Rugel's Plantain. (Fig. 3379.)

Plantago Rugelii in DC. Prodr. 13: Part 1, 700. 1852.

Similar to the preceding species, the spikes less dense, at least toward the base, usually long-attenuate at the summit, sometimes 5″ thick. Sepals oblong, prominently keeled on the back, the margins green or scarious; pyxis oblong-cylindric, 2″–3″ long, twice as long as the sepals, circumscissile much below the middle and entirely within the calyx, 4–10 seeded; corolla-lobes spreading or reflexed on the summit of the pyxis; stamens 4.

In fields, woods and waste places, Maine and Ontario to Minnesota, south to Florida, Kansas and Texas. Petioles commonly purple at the base. Usually brighter green and with thinner leaves than *P. major*. This species, or the preceding one, was known to the Indians as "White Man's Foot." June–Sept.

3. Plantago lanceolàta L. Ribwort. Rib-grass. English Plantain. Snake Plantain. (Fig. 3380.)

Plantago lanceolata L. Sp. Pl. 113. 1753.

Perennial or biennial, more or less pubescent; rootstock short, erect, with tufts of brown hairs at the bases of the leaves. Leaves narrowly oblong-lanceolate, mostly erect, shorter than the scapes, entire, acute or acuminate at the apex, gradually narrowed into petioles, 3–5-ribbed, 2′–12′ long, 3″–12″ wide; scapes slender, channelled, sometimes 2½° tall; spikes very dense, at first short and ovoid, becoming cylindric, blunt and ½′–4′ long in fruit, 4″–6″ thick; flowers perfect, proterogynous; sepals ovate, with a narrow green midrib and broad scarious margins, the two lower ones commonly united; corolla glabrous, its tube very short; filaments white; pyxis oblong, very obtuse, 2-seeded, slightly longer than the calyx, circumscissile at about the middle; seeds deeply excavated on the face.

In fields and waste places, New Brunswick to the Northwest Territory and British Columbia, south to Florida and Kansas. Naturalized from Europe; native also of Asia. Sepals rarely metamorphosed into small leaves. April–Nov. Old names, Black-jacks, Jack-straws, Dog's-rib, Cocks, Kemps, Leechwort, Ram's-tongue, Rattail, Windles, Long Plantain, Ripple-grass, Kempseed, Headsman, Hen-plant, Clock, Chimney-sweeps.

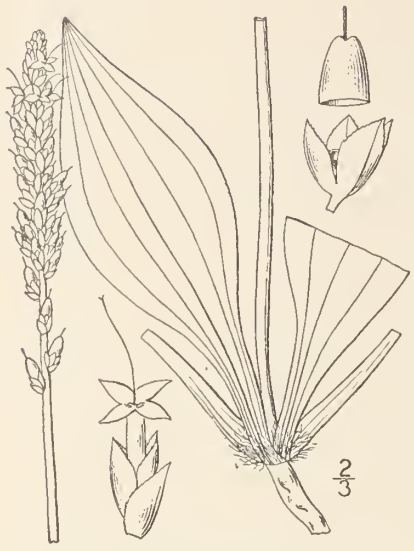
4. Plantago mèdia L. Hoary Plantain. (Fig. 3381.)

Plantago media L. Sp. Pl. 113. 1753.

Perennial, intermediate in aspect between *P. major* and *P. lanceolata*, the short rootstock clothed with brown hairs among the bases of the leaves. Leaves spreading, ovate, broadly oblong or elliptic, obtuse or acute at the apex, entire, or repand-dentate, densely and finely canescent, 5–7-ribbed, narrowed at the base into margined, usually short petioles; scapes slender, much longer than the leaves, 1°–2° tall; spikes very dense, cylindric and 1′–3′ long in fruit, about 3″ thick; flowers perfect, white; sepals all distinct, oblong, with a narrow green midrib and broad scarious margins; corolla glabrous; stamens pink or purple; pyxis oblong, obtuse, about as long as the calyx, 2–4-seeded, the seeds merely concave on the face; stamens 4.

In waste places, Maine, Rhode Island, Ontario and New York. Adventive from Europe. Native also of Asia. May–Sept. Old names, Fire-leaves, Fire-weed, Lamb's Lettuce, Lamb's Tongue, Healing Herb.

5. Plantago eriópoda Torr. Saline Plantain. (Fig. 3382.)



Plantago glabra Nutt. Gen. 1: 100. 1818?
Plantago eriopoda Torr. Ann. Lyc. N. Y. 2: 237. 1827.

Perennial, succulent; rootstock long, usually densely covered with long brown hairs among the bases of the leaves. Leaves oblong, oblong-lanceolate, or oblanceolate, entire, or repand-dentate, acute at the apex, narrowed into petioles, 5–9-ribbed, 3′–12′ long, ½′–1½′ wide, glabrous or very nearly so; scapes stout, more or less pubescent, longer than the leaves, 6′–18′ high; spikes 1′–5′ long, dense above, the lower flowers scattered; flowers perfect; sepals distinct, oblong-obovate with a narrow green midrib and broad scarious margins; corolla glabrous, its lobes spreading or reflexed; pyxis ovoid-oblong, very obtuse, one-third longer than the calyx, 2–4-seeded, circumscissile below the middle; seeds nearly flat.

In maritime or saline soil, Nova Scotia to Minnesota, California and the Northwest Territory. June–Sept.

6. Plantago sparsiflòra Michx. Southern Plantain. (Fig. 3383.)

Plantago sparsiflora Michx. Fl. Bor. Am. 1: 94. 1803.

Perennial, pubescent, or glabrate; scapes very slender, sometimes 2° tall, much longer than the leaves. Leaves thin, oblong-lanceolate, 3′–10′ long, ½′–1′ wide, 5–7-ribbed, acute or acuminate at the apex, entire, narrowed into slightly margined petioles; spikes loosely flowered, sometimes 1° long; flowers perfect; sepals oblong or oval, rather rigid, with a broad green midrib and narrow scarious margins; corolla glabrous, its lobes not erect over the fruit; pyxis oblong, 2½″ long, twice as long as the calyx, 2-seeded; seeds convex on the back, slightly concave on the face.

In sandy dry soil, North Carolina to Florida and in southern Illinois.

7. Plantago cordàta Lam. Heart-leaved Plantain. Water Plantain. (Fig. 3384.)

Plantago cordata Lam. Tabl. Encycl. 1: 338. 1791.

Perennial, glabrous, purple-green; rootstock short, very stout. Leaves broadly ovate or nearly orbicular, pinnately veined, obtuse or acute at the apex, entire or dentate, rounded, abruptly narrowed, or cordate at the base, often 10′ long; petioles stout, margined above; scapes stout, longer than the leaves; spikes loosely flowered, sometimes 1° long, with interrupted clusters; flowers perfect; sepals ovate to obovate, obtuse, green; corolla-lobes spreading; pyxis ovoid-globose, obtuse, circumscissile at or slightly below the middle, 1–4-seeded; seeds not excavated on the face.

In swamps and along streams, New York to Alabama, west to Missouri and Louisiana. March–July.

8. Plantago marítima L. Sea or Seaside Plantain. (Fig. 3385.)

Plantago maritima L. Sp. Pl. 114. 1753.
Plantago decipiens Barneoud, Mon. Plantag. 16. 1845.

Annual, biennial, or perennial, fleshy; rootstock stout or slender, sometimes with tufts of whitish hairs among the bases of the leaves. Leaves linear, glabrous, very obscurely nerved, sessile, or narrowed into short margined petioles, 2′–10′ long, entire, or with a very few small teeth, 1″–2½″ wide; scapes slender, more or less pubescent, longer than or equalling the leaves; spikes dense, linear-cylindric, blunt, 1′–5′ long; flowers perfect; sepals ovate-lanceolate to nearly orbicular, green, somewhat keeled; corolla pubescent without, its lobes spreading; pyxis ovoid-oblong, obtuse, 2–4-seeded, circumscissile at about the middle, nearly twice as long as the calyx; seeds nearly flat on the face.

In salt marshes and on sea-shores, Labrador to New Jersey, and on the Pacific Coast from Alaska to California. Also on the coasts of Europe and Asia. Called also Buckshorn, Gibbals, Sea Kemps. June–Sept.

9. Plantago Púrshii R. & S. Pursh's Plantain. (Fig. 3386.)

Plantago Purshii R. & S. Syst. 3: 120. 1818.
Plantago gnaphalioides Nutt. Gen. 1: 100. 1818.
Plantago Patagonica var. *gnaphalioides* A. Gray, Man. Ed. 2, 269. 1856.

Annual, woolly or silky all over, pale green; scapes slender, 2′–15′ tall, longer than the leaves. Leaves ascending, linear, acute or acuminate at the apex, narrowed into margined petioles, 1–3-nerved, 1½″–4″ wide, entire, or very rarely with a few small teeth; spikes very dense, cylindric, obtuse, 1′–5′ long, about 3″ in diameter, exceedingly woolly; bracts rigid, equalling or slightly exceeding the flowers; flowers perfect but heterogonous, many of them cleistogamous; sepals oblong, obtuse, scarious-margined; corolla-lobes broadly ovate, spreading; stamens 4; pyxis oblong, obtuse, 1¼″ long, little exceeding the calyx, 2-seeded, circumscissile at about the middle; seeds convex on the back, deeply concave on the face.

On dry plains and prairies, Illinois and western Ontario to British Columbia, south to Texas and northern Mexico. May–Aug.

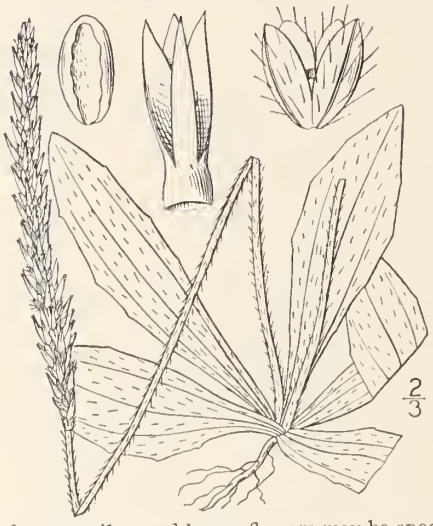
10. Plantago aristàta Michx. Large-bracted Plantain. (Fig. 3387.)

Plantago aristata Michx. Fl. Bor. Am. 1: 95. 1803.
Plantago Patagonica var. *aristata* A. Gray, Man. Ed. 2, 269. 1856.

Annual, dark green, villous, or glabrate; scapes stout, erect, 6′–18′ tall, exceeding the leaves. Leaves linear, acuminate at the apex, entire, narrowed into slender petioles, sometimes prominently 3-ribbed, 1½″–4″ wide; spikes very dense, cylindric, 1′–6′ long, pubescent but not woolly; bracts puberulent, linear, elongated, ascending, the lower often 10 times as long as the flowers; flowers very similar to those of the preceding species; pyxis 2-seeded; the seeds concave on the face.

On dry plains and prairies, Illinois to Louisiana and Texas, west to British Columbia and New Mexico. Also widely adventive as a weed in the eastern States from Maine to Georgia, its eastern natural limits now difficult to determine. May–Oct.

11. Plantago Virgínica L. Dwarf or White Dwarf Plantain. (Fig. 3388.)



Plantago Virginica L. Sp. Pl. 113. 1753.

Annual or biennial, pubescent or villous; scapes erect, slender, 1′–18′ high, much longer than the leaves. Leaves spatulate or obovate, obtuse or acutish, thin, entire, or repand-denticulate, narrowed into margined petioles, or almost sessile, varying greatly in size, 3–5-nerved, ascending or spreading; spikes very dense, or the lower flowers scattered, linear-cylindric, obtuse, 3″–4″ thick, usually 1′–4′ long, but in dwarf forms reduced to 2–6 flowers; flowers imperfectly dioecious; corolla-lobes of the fertile plants erect and connivent on the top of the pyxis, those of the sterile widely spreading; stamens 4; pyxis oblong, about as long as the calyx, appearing beaked by the connivent corolla-lobes, 2–4-seeded.

In dry soil, Connecticut to Florida, west to Illinois, Missouri, Arizona and northern Mexico. March–July.

Plantago occidentàlis Dec. (*P. Virginica* var. *longifolia* A. Gray), of the Southwest, with larger leaves, longer spikes and larger flowers may be specifically distinct. It is reported from Missouri.

12. Plantago elongàta Pursh. Slender Plantain. (Fig. 3389.)

Plantago elongata Pursh, Fl. Am. Sept. 729. 1814.
Plantago pusilla Nutt. Gen. 1: 100. 1818.

Annual, puberulent; scapes filiform, 2′–7′ high, longer than the linear-filiform, mostly entire, blunt-pointed obscurely 1-nerved leaves. Leaves about ½″ wide; spikes slender, linear, rather loosely flowered, ½′–3′ long, 1½″–2″ thick; flowers imperfectly dioecious, or polygamous; sepals oblong, obtuse, about as long as the bract, scarious-margined; corolla-lobes of the more fertile plants becoming erect over the pyxis; stamens 2; pyxis ovoid-oblong, obtuse, one-fourth to one-third longer than the calyx, about 4-seeded, circumscissile at about the middle; seeds nearly flat on both sides.

In dry sandy soil, southern New York to Virginia and Louisiana, west to Illinois, Oregon, Utah and Texas. April–Aug.

13. Plantago heterophýlla Nutt. Many-seeded Plantain. (Fig. 3390.)

Plantago heterophylla Nutt. Trans. Am. Phil. Soc. (II.) 5: 177. 1833–37.

Annual, similar to the preceding species, but glabrous or slightly puberulent; scapes ascending or spreading, equalling or exceeding the leaves, 2′–10′ long. Leaves narrowly linear or filiform, the larger about 2″ wide, entire or often with several distant small teeth or linear lobes; spikes loose, linear, ½′–5′ long; sepals oblong, obtuse, scarious-margined, mostly shorter than the bract; corolla-lobes in the more fertile plants becoming erect over the pyxis; stamens 2; pyxis oblong, subacute, about twice as long as the calyx, 7–30-seeded, circumscissile rather below the middle; seeds somewhat angled, scarcely concave on the face.

In moist soil, New Jersey to Florida, west to Alabama, Texas and southern California. April–July.

14. Plantago arenària W. & K. Sand Plantain. (Fig. 3391.)

Plantago arenaria W. & K. Pl. Rar. Hung. 1: 51. *pl. 51.* 1802.

Annual, pubescent, somewhat viscid; stem simple, or commonly becoming much branched, leafy, 3′–15′ high. Leaves opposite, or whorled, narrowly linear, entire, sessile, 1′–3′ long, about 1″ wide; peduncles axillary, often umbellate at the ends of the stem and branches, slender, as long as the leaves or longer; heads of flowers conic, oval, or subglobose, 5″–10″ long, about 5″ thick; lower bracts acute or acuminate; calyx-lobes unequal; corolla-lobes ovate to lanceolate, acute; capsule 2-seeded.

Dayton, Ohio. Adventive or fugitive from central Europe. Summer.

2. LITTORÉLLA L. Mant. 2: 295. 1771.

A low perennial succulent herb, with linear entire basal leaves and monoecious flowers, the staminate solitary or two together at the summits of slender scapes, the pistillate sessile among the leaves. Sepals 4. Corolla of the staminate flowers with a somewhat urceolate tube, and a spreading 4-lobed limb. Corolla of the pistillate flowers urn-shaped, 3–4-toothed. Staminate flowers with 4 long-exserted stamens, their filaments filiform, the anthers ovate. Pistillate flowers with a single ovary and a long-exserted filiform style. Fruit an indehiscent 1-seeded nutlet. [Latin, shore.]

A monotypic genus of Europe and northern North America.

1. Littorella uniflòra (L.) Rusby. Plantain Shore-weed. Shore-grass. (Fig. 3392.)

Plantago uniflora L. Sp. Pl. 115. 1753.
Littorella lacustris L. Mant. 2: 295. 1771.
Littorella uniflora Rusby, Mem. Torr. Club, 5: 301. 1894.

Tufted, usually growing in mats; leaves bright green, 1′–3′ long, ½″–1″ wide, spreading or ascending, mostly longer than the scapes of the staminate flowers, which bear a small bract at about the middle; sepals lanceolate, mostly obtuse, with a dark green midrib and lighter margins, sometimes only 3 in the fertile flowers; stamens conspicuous, 4″–6″ long; corolla-lobes ovate, subacute; pistillate flowers very small; nutlet about 1″ long.

Borders of lakes and ponds, Maine and Vermont to Nova Scotia and Ontario. July–Aug.

Family 34. RUBIÀCEAE B. Juss. Hort. Trian. 1759.

MADDER FAMILY.

Herbs, shrubs, or trees, with simple, opposite or sometimes verticillate, mostly stipulate leaves, and perfect, often dimorphous or trimorphous, regular and nearly symmetrical flowers. Calyx-tube adnate to the ovary, its limb various. Corolla gamopetalous, funnelform, club-shaped, campanulate, or rotate, 4–5-lobed, often pubescent within. Stamens as many as the lobes of the corolla and alternate with them, inserted on its tube or throat; anthers mostly linear-oblong. Ovary 1–10-celled; style short or elongated, simple or lobed; ovules 1–∞ in each cavity. Fruit a capsule, berry, or drupe. Seeds various; seed-coat membranous or crustaceous; endosperm fleshy or horny (wanting in some exotic genera); cotyledons ovate, cordate, or foliaceous.

About 355 genera and 5500 species of very wide geographic distribution, most abundant in tropical regions. Known as Madderworts.

* Leaves opposite, stipulate (sometimes verticillate in No. 3).

Ovules numerous in each cavity of the ovary; herbs.
- Top of the capsule free from the ovary; seeds few, peltate. 1. *Houstonia.*
- Capsule wholly adnate to the ovary; seeds minute, angular. 2. *Oldenlandia.*

Ovules 1 in each cavity of the ovary.
- Shrubs; flowers in dense globular heads. 3. *Cephalanthus.*
- Low evergreen herbs; flowers 2 together, their ovaries united. 4. *Mitchella.*
- Herbs; flowers axillary, nearly sessile, distinct.
  - Capsule separating into 2 dehiscent carpels. 5. *Spermacoce.*
  - Capsule separating into 2 (or 3) indehiscent carpels. 6. *Diodia.*

* * Leaves appearing verticillate; herbs (some of the leaves rarely opposite in No. 7).

Corolla rotate; calyx teeth minute or none. 7. *Galium.*

Corolla funnelform.
- Flowers in involucrate heads. 8. *Sherardia.*
- Flowers in panicles. 9. *Asperula.*

1. HOUSTÒNIA L. Sp. Pl. 105. 1753.

Erect or diffuse, usually tufted herbs, with opposite entire often ciliate leaves, and small blue purple or white, mostly dimorphous flowers. Calyx-tube globose or ovoid, 4-lobed, the lobes distant. Corolla funnelform or salverform, 4-lobed, the lobes valvate, the throat glabrous or pubescent. Stamens 4, inserted on the tube or throat of the corolla; anthers linear or oblong. Ovary 2-celled. Style slender; ovules numerous in each cavity; stigmas 2, linear. Capsule partly inferior, its summit free from the calyx, globose-didymous, or emarginate at the apex, loculicidally dehiscent above. Seeds few or several in each cavity, peltate, more or less concave, not angled. Seed-coat reticulate or roughened; endosperm horny; embryo club-shaped. [Named in honor of Dr. William Houston, botanist and collector in South America, died 1733.]

About 25 species, natives of North America and Mexico.

* Plants 1′–7′ high; peduncles 1-flowered.

† Peduncles filiform, 1′–2½′ long.

Erect; leaves obovate or spatulate, narrowed into petioles. 1. *H. coerulea.*
Diffuse or spreading; leaves nearly orbicular. 2. *H. serpyllifolia.*

† † Peduncles 3″–18″ long, stouter.

Calyx-lobes narrow, about equalling the capsule. 3. *H. minor.*
Calyx-lobes broad, much exceeding the capsule. 4. *H. minima.*

* * Plants 4′–18′ high; flowers cymose.

Leaves broad, ovate, or ovate-lanceolate. 5. *H. purpurea.*
Leaves oblong or spatulate, ciliate. 6. *H. ciliolata.*
Leaves linear-lanceolate or oblanceolate, not ciliate. 7. *H. longifolia.*
Leaves filiform or narrowly linear.
- Flowers loosely cymose on filiform pedicels; leaves not fascicled. 8. *H. tenuifolia.*
- Flowers densely cymose on very short pedicels; leaves usually fascicled. 9. *H. angustifolia.*

1. Houstonia coerùlea L. Bluets. Innocence. (Fig. 3393.)

Houstonia coerulea L. Sp. Pl. 105. 1753.
Hedyotis coerulea Hook. Fl. Bor. Am. 1: 286. 1833.
Oldenlandia coerulea A. Gray, Man. Ed. 2, 174. 1856.

Erect, 3′–7′ high, glabrous, or nearly so, perennial by slender rootstocks and forming dense tufts. Lower and basal leaves spatulate or oblanceolate, about 6″ long; sometimes hirsute or ciliate, narrowed into a petiole, the upper oblong, sessile; flowers solitary on filiform terminal and axillary peduncles; corolla salverform, violet, blue, or white with a yellow center, 4″–6″ broad, its tube slender and about the length of the lobes; capsule didymous, compressed, about 2″ broad and broader than long, the upper half free from the calyx and shorter than its lobes.

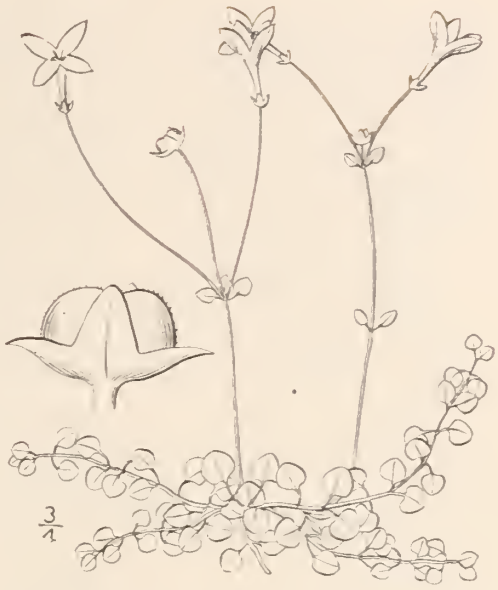
In open grassy places, or on wet rocks, Nova Scotia to Quebec, New York and Michigan, south to Georgia and Alabama. April–July, or producing a few flowers through the summer. Called also Quaker Ladies, Quaker bonnets, Venus' Pride.

2. Houstonia serpyllifòlia Michx. Thyme-leaved Bluets. (Fig. 3394.)

Houstonia serpyllifolia Michx. Fl. Bor. Am. 1: 85. 1803.
Hedyotis serpyllifolia T. & G. Fl. N. A. 2: 39. 1841.

Perennial; stems prostrate or diffuse, slender, glabrous, 4′–10′ long. Leaves orbicular or broadly oval, abruptly petioled, 3″–4″ long, sometimes hispidulous; or those of the flowering stems narrower, distant; flowers on terminal and axillary filiform peduncles; corolla usually deep blue, 4″–6″ broad, its tube rather shorter than the lobes; capsule similar to that of the preceding species but usually slightly larger, nearly as long as the calyx.

High mountains of Virginia and West Virginia to South Carolina and east Tennessee. May.



3. Houstonia mìnor (Michx.) Britton. Small Bluets. (Fig. 3395.)

Houstonia Linnaei var. *minor* Michx. Fl. Bor. Am. 1: 35. 1803.
Houstonia patens Ell. Bot. S. C. & Ga. 1: 191. 1821.
Houstonia minor Britton, Mem. Torr. Club, 5: 302. 1894.

Annual, glabrous or nearly so, branched from the base, 1′–6′ high. Lower and basal leaves oval or ovate, 5″–6″ long, narrowed into petioles often of their own length, the upper narrower and sessile; peduncles axillary and terminal, divergent, 3″–18″ long, 1-flowered; corolla violet-blue or purple, 3″–4″ broad, its tube about equalling the lobes; capsule compressed, didymous, 2½″–3″ broad, its upper part free from the calyx and about equalling or exceeding the subulate lobes.

In dry soil, Virginia to Florida, Arkansas and Texas. March–April.

4. Houstonia mínima Beck. Least Bluets. (Fig. 3396.)

Houstonia minima Beck, Am. Journ. Sci. 10: 262. 1826.
Hedyotis minima T. & G. Fl. N. A. 2: 38. In part. 1841.
Oldenlandia minima A. Gray, Man. Ed. 2, 173. 1856.

Annual, spreading or diffuse, 1′–2½′ high, roughish. Lower and basal leaves oval or ovate, with petioles shorter than or equalling the blade, the upper oblong, sessile; peduncles axillary and terminal, rather stout, 3″–12″ long; flowers 4″–5″ broad; corolla violet or purple, the tube longer than the lobes; capsule didymous, compressed, about 3″ broad, its upper part free from the calyx and considerably exceeded by the lanceolate foliaceous lobes.

In dry soil, Missouri (and Illinois?) to Arkansas and Texas. March–April.

5. Houstonia purpùrea L. Large Houstonia. (Fig. 3397.)

Houstonia purpurea L. Sp. Pl. 105. 1753.
Hedyotis purpurea T. & G. Fl. N. A. 2: 40. 1841.
Oldenlandia purpurea A. Gray, Man. Ed. 2, 173. 1856.

Perennial, stout, erect, tufted, branched or simple, glabrous or somewhat pubescent, 4′–18′ high. Leaves ovate or ovate-lanceolate, sessile, or the lower ones short-petioled, 3–5-nerved and pinnately veined, obtuse or acute, ½′–2′ long, 3″–15″ wide, the margins often ciliate; flowers in terminal cymose clusters; pedicels 1″–4″ long; corolla purple or lilac, funnelform, 3″–4″ long, the tube at least twice as long as the lobes; capsule compressed-globose, 1½″ broad, somewhat didymous, its upper half free and considerably shorter than the subulate-linear calyx-lobes.

In open places, Maryland to Kentucky, Georgia and Alabama, especially in the mountains. May–Sept.

Houstonia purpùrea pubéscens Britton, Mem. Torr. Club, 4: 125. 1894.

Whole plant densely pubescent. Virginia.

Houstonia purpùrea calycòsa A. Gray, Syn. Flor. 1: Part 2, 26. 1878.

Leaves lanceolate or narrower, firm; calyx-lobes subulate, 2″–4″ long. North Carolina to Georgia, Alabama and Missouri. Perhaps specifically distinct.

6. Houstonia ciliolàta Torr. Fringed Houstonia. (Fig. 3398.)

Houstonia ciliolata Torr. Fl. N. U. S. 1: 173. 1824.
Houstonia purpurea var. *ciliolata* A. Gray, Man. Ed. 5, 212. 1867.

Perennial, tufted, erect or ascending, 4′–7′ high. Lower and basal leaves petioled, thick, 1-nerved, obovate or oblanceolate, obtuse, 6″–10″ long, their margins conspicuously ciliate; stem leaves oblong or oblanceolate, sessile or nearly so; flowers in corymbed cymes; pedicels filiform, 1″–4″ long; corolla funnelform, lilac or pale purple, about 3″ long, the lobes about one-third the length of the tube; capsule little compressed, obscurely didymous, 1½″ wide, overtopped by the linear-lanceolate calyx-lobes.

On rocks and shores, Maine (?), Ontario to Michigan, south to Pennsylvania, West Virginia, Kentucky and Arkansas. May–Aug.

7. Houstonia longifòlia Gaertn. Long-leaved Houstonia. (Fig. 3399.)

Houstonia longifolia Gaertn. Fruct. 1: 226. *pl. 49. f. 8.* 1788.
Houstonia purpurea var. *longifolia* A. Gray, Man. Ed. 5, 212. 1868.

Perennial, usually tufted, erect, glabrous, 5′–10′ high. Basal leaves spatulate or oblanceolate, obtuse, not ciliate, very short-petioled; stem leaves linear or linear-oblong, acute or obtuse, 1-nerved, 6″–12″ long, 1″–2½″ wide; flowers in corymbed cymes; corolla pale purple or nearly white, 2½″–3″ long, its lobes about one-third the length of the tube; capsule little compressed, globose-ovoid, about 1″ in diameter, its upper half free and much exceeded by the subulate calyx-lobes.

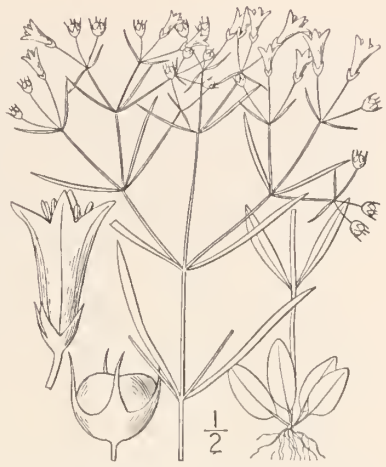
In dry open places, Maine and Ontario to Manitoba, south to Georgia and Missouri. May–Sept.

8. Houstonia tenuifòlia Nutt. Slender-leaved Houstonia. (Fig. 3400.)

Houstonia tenuifolia Nutt. Gen. 1: 95. 1818.
Houstonia purpurea var. *tenuifolia* A. Gray, Syn. Flor. 1: Part 2, 26. 1878.

Perennial, somewhat tufted, very slender and widely branching, erect, glabrous, 6′–1° high, sometimes finely pubescent below. Basal and lowest stem leaves ovate or oval, obtuse, petioled, 4″–6″ long; upper leaves narrowly linear or filiform, blunt-pointed, 6″–15″ long, ½″–1½″ wide; flowers in loose corymbose cymes; pedicels filiform, 2″–6″ long; corolla purple, narrow, 2″–3″ long, its lobes short; capsule compressed-globose, didymous, about 1″ in diameter, its upper half free and only slightly exceeded by the subulate calyx-lobes.

In dry soil, Virginia to Ohio, North Carolina and Tennessee. May–July.



9. Houstonia angustifòlia Michx. Narrow-leaved Houstonia. (Fig. 3401.)

Houstonia angustifolia Michx. Fl. Bor. Am. 1: 85. 1803.
Oldenlandia angustifolia A. Gray, Pl. Wright. 2: 68. 1853.

Perennial by a deep root, erect, stiff, glabrous, usually branched, 1°–2° high. Leaves linear, 6″–18″ long, 1″–2″ wide, or the lowest narrowly spatulate, usually with numerous smaller ones fascicled in the axils, or on short axillary branches; flowers in terminal dense cymose clusters; pedicels short; corolla white or purplish, between funnelform and salverform, about 2″ long, its lobes shorter than the tube; capsule compressed-obovoid, 1½″ wide, its summit free and scarcely exceeded by the calyx-lobes.

In dry open places, Illinois to Kansas and Texas, east Tennessee and Florida. May–July.

2. OLDENLÁNDIA L. Sp. Pl. 119. 1753.

Erect or diffuse slender herbs, with opposite leaves, and small axillary or terminal, solitary or clustered, white or pink flowers. Calyx-tube obovoid or subglobose, the limb 4-toothed. Corolla rotate or salverform, 4-lobed. Stamens 4, inserted on the throat of the corolla; anthers oblong. Ovary 2-celled; ovules numerous in each cavity; style slender, 2-lobed. Capsule small, ovoid, top-shaped, or hemispheric, wholly adnate to the calyx-tube, loculicidally dehiscent at the summit, several or many-seeded. Seeds angular, not peltate; endosperm fleshy; embryo club-shaped. [Named for H. B. Oldenland, a Danish botanist.]

About 175 species, mostly of tropical distribution, most abundant in Asia. Besides the following, 2 others occur in the southern States and 1 in New Mexico.

1. Oldenlandia uniflòra L. Clustered Bluets. (Fig. 3402.)

Oldenlandia uniflora L. Sp. Pl. 119. 1753.
Oldenlandia glomerata Michx. Fl. Bor. Am. 1: 83. 1803.

Weak, usually tufted, more or less hirsute-pubescent, diffuse or ascending; stems 1′–15′ long. Leaves short-petioled or sessile, mostly thin, entire, 3–5-nerved, ovate, oblong, or oval, acute at the apex, narrowed at the base, ½′–1′ long; flowers sessile or nearly so, white, about 1″ broad, terminal and axillary, clustered or solitary; calyx-hirsute, hemispheric in fruit, the ovate or oval lobes erect and nearly equalling the tube.

In low grounds, southern New York to Florida and Texas. Also in Cuba. Root annual. June–Sept.

3. CEPHALÁNTHUS L. Sp. Pl. 95. 1753.

Shrubs, or some tropical species small trees, with opposite or verticillate short-petioled entire leaves, and terminal or axillary, densely capitate, bracteolate small white or yellow flowers. Calyx-tube obpyramidal, its limb with 4 obtuse lobes. Corolla tubular-funnelform, with 4 short erect or spreading lobes. Stamens 4, inserted on the throat of the corolla, filaments very short; anthers oblong, 2-cuspidate at the base. Ovary 2-celled; ovules solitary in each cavity, pendulous; style filiform, exserted; stigma capitate. Fruit dry, obpyramidal, 1–2-seeded. Endosperm cartilaginous; cotyledons linear-oblong. [Greek, head-flower.]

About 6 species, natives of America and Asia. The following is the only one known to occur in North America, unless the southwestern and Mexican plant proves to be distinct.

1. Cephalanthus occidentàlis L. Button-bush. Button-tree. Honey-balls. Globe-flower. (Fig. 3403.)

Cephalanthus occidentalis L. Sp. Pl. 95. 1753.

A shrub 3°–12° high, with opposite or verticillate leaves and branches, glabrous, or somewhat pubescent. Leaves petioled, ovate or oval, entire, acuminate or acute at the apex, rounded or narrowed at the base, 3′–6′ long, 1′–2½′ wide; peduncles 1′–3′ long; heads globose, about 1′ in diameter, the receptacle pubescent; flowers sessile, white, 4″–6″ long; style very slender, about twice the length of the corolla; calyx-tube prolonged beyond the ovary.

In swamps, and low grounds, New Brunswick to western Ontario and California, south to Florida, Texas and Arizona. Also in Cuba. Also called Pond Dogwood, Buttonwood Shrub. June–Sept.

4. MÍTCHELLA L. Sp. Pl. 111. 1753.

Creeping herbs, with opposite petioled, entire or undulate, evergreen leaves, and white axillary or terminal peduncled geminate dimorphous flowers, their ovaries united. Calyx-tube ovoid, the limb 3–6-lobed (usually 4-lobed). Corolla funnelform, usually 4-lobed, the lobes recurved, bearded on the inuer side. Stamens as many as the lobes of the corolla and inserted on its throat; filaments short and style exserted, or filaments exserted and style short. Ovary 4-celled; stigmas 4, short, filiform; ovules 1 in each cavity, erect, anatropous. Fruit composed of 2 united drupes usually containing 8 roundish nutlets. Seed erect; cotyledons short, obtuse; embryo minute. [Named after Dr. John Mitchell, botanist and correspondent of Linnaeus in Virginia.]

Two species, one North American, the other Japanese.

1. Mitchella rèpens L. Partridge-berry. Twin-berry. (Fig. 3404.)

Mitchella repens L. Sp. Pl. 111. 1753.

Stems slender, trailing, rooting at the nodes, 6′–12′ long, branching, glabrous, or very slightly pubescent. Leaves ovate-orbicular, petioled, obtuse at the apex, rounded or somewhat cordate at the base, 3″–10″ long, pinnately veined, dark green, shining; peduncles shorter than the leaves, bearing 2 sessile white flowers at the summit; corolla 5″–6″ long; drupes red (rarely white), broader than high, 2″–4″ in diameter, persistent through the winter, edible.

In woods, Nova Scotia to Florida, west to western Ontario, Minnesota, Arkansas and Texas. April–June, sometimes flowering a second time in the autumn. Called also Hive- or Squaw-vine, Checker-berry, Deer-berry, Fox- or Box-berry, Partridge-vine and Winter Clover. Leaves often whitish-veined; flower-buds pink. Ascends 5000 ft. in Virginia.

5. SPERMACÒCE L. Sp. Pl. 102. 1753.

Herbs, with 4-sided stems, opposite pinnately veined stipulate leaves, and small white flowers, in dense axillary and terminal clusters. Calyx-tube obovoid or obconic, its limb 4-toothed. Corolla funnelform, 4-lobed. Stamens 4, inserted on the tube of the corolla; anthers oblong or linear. Ovary 2-celled; ovules 1 in each cavity; style slender; stigma capitate, or slightly 2-lobed. Capsule coriaceous, didymous, of 2 dehiscent carpels, or one dehiscent, the other indehiscent. Seeds oblong, convex on the back; endosperm horny; embryo central; cotyledons foliaceous. [Greek, seed-point, from the sharp calyx-teeth surmounting the carpels.]

Two species, natives of America.

1. Spermacoce glàbra Michx. Smooth Button-weed. (Fig. 3405.)

Spermacoce glabra Michx. Fl. Bor. Am. 1: 82. 1803.

Glabrous, decumbent or ascending, rather stout; stems 10′–20′ long. Leaves lanceolate or elliptic-lanceolate, petioled, or the uppermost sessile, 1′–3′ long, 4″–12″ wide, acute at each end, the margins rough; corolla pubescent in the throat, about 1½″ long, scarcely exceeding the ovate-lanceolate acute calyx teeth; stamens and style included; capsule obovoid, about 2″ long, glabrous; seeds black, punctate.

On river-banks and in wet soil, southern Ohio and Kentucky to Florida and Texas. Also in tropical America. June–Sept.

6. DIÒDIA L. Sp. Pl. 104. 1753.

Decumbent or ascending branching herbs, with opposite, mostly sessile, entire conspicuously stipulate leaves, and small axillary white lilac or purple flowers. Calyx tube obconic or obovoid, the limb 2–4-lobed (sometimes 1–6-lobed), often with minute teeth between the lobes. Corolla funnelform or salverform, mostly 4-lobed. Stamens usually 4, inserted on the throat of the corolla; filaments slender; anthers versatile, oblong-linear, exserted. Ovary 2-celled (rarely 3–4-celled); ovules 1 in each cavity; style filiform, simple, or 2-cleft; stigmas 2. Fruit crustaceous or somewhat fleshy, oblong, obovoid, or subglobose, 2-celled, finally separating into 2 indehiscent carpels. Seed oblong, convex on the back; endosperm horny; cotyledons foliaceous; embryo straight. [Greek, thoroughfare, where the species are frequently found.]

About 35 species, mostly American. Besides the following, another occurs in the southern States.

Leaves linear-lanceolate; style entire; stigmas capitate. 1. *D. teres.*
Leaves lanceolate or oval; style 2-cleft; stigmas filiform. 2. *D. Virginiana.*

1. Diodia tères Walt. Rough Button-weed. (Fig. 3406.)

Diodia teres Walt. Fl. Car. 87. 1788.

Spermacoce diodina Michx. Fl. Bor. Am. 1: 82. 1803.

Rigid, usually rough, much branched from near the base, the branches prostrate or ascending, 4-sided above, 4′–30′ long. Leaves linear or linear-lanceolate, very rough, ½′–1½′ long, 1½″–3″ wide, acute, the margins revolute when dry; flowers lilac or purple, 2″–3″ long, usually solitary in the axils; style entire; stigmas capitate; fruit obovoid or top-shaped, hispid, about 2″ high, the usually 4 persistent calyx-lobes ovate to lanceolate.

In dry or sandy soil, Connecticut to Florida, west to Illinois, Missouri, Texas, New Mexico and Sonora. July–Sept.

2. Diodia Virginiàna L. Larger Button-weed. (Fig. 3407.)

Diodia Virginiana L. Sp. Pl. 104. 1753.

Hispid-pubescent or glabrate, much branched from near the base, the branches procumbent or ascending, 1°–2° long. Leaves lanceolate to narrowly oval, narrowed at the base, acute, or the lowest obtuse at the apex, 1′–3′ long; flowers 1 or 2 in each axil, about 6″ long, the corolla-tube very slender; fruit somewhat fleshy, but becoming dry, hirsute or glabrous, oval, 3″–4″ high, furrowed, crowned with the 2 or 3 persistent lanceolate calyx-lobes.

In moist soil, southern New Jersey to Florida, west to Arkansas and Texas. June–Aug.

7. GÀLIUM L. Sp. Pl. 105. 1753.

Annual or perennial herbs, with 4-angled slender stems and branches, apparently verticillate leaves, and small white green yellow or purple flowers, mostly in axillary or terminal cymes or panicles, the pedicels usually jointed with the calyx. Flowers perfect, or in some species dioecious. Calyx-tube ovoid or globose, the limb minutely toothed, or none. Corolla rotate, 4-lobed (rarely 3-lobed). Stamens 4, rarely 3; filaments short; anthers exserted. Ovary 2-celled; ovules 1 in each cavity. Styles 2, short; stigmas capitate. Fruit didymous, dry or fleshy, smooth, tuberculate, or hispid, separating into 2 indehiscent carpels, or sometimes only 1 of the carpels maturing. Seed convex on the back, concave on the face, or spherical and hollow; endosperm horny; embryo curved; cotyledons foliaceous. [Greek, milk, from the use of *G. verum* for curdling.]

About 225 species, of wide geographic distribution. Besides the following, about 27 others occur in the southern and western parts of North America. The leaves are really opposite, the intervening members of the verticils being stipules.

* Fruit dry, smooth, hispid or roughened.

† *Annuals.* (except No. 1.)

1. Flowers yellow; leaves narrowly linear. 1. *G. verum.*
2. Flowers white or greenish white.
   a. Fruit smooth and glabrous. 2. *G. Mollugo.*
   b. Fruit bristly, tubercled or papillose.

Flowers in axillary cymules, or panicled.
Fruit granular or tubercled, not bristly.
Fruit slightly granular, or smooth, ½″ broad; pedicels not recurved; stem very slender. 3. *G. Parisiense.*
Fruit granular-tubercled, 1½″ broad; fruiting pedicels recurved; stem stout. 4. *G. tricorne.*
Fruit densely bristly-hispid.
Cymes few-flowered; leaves 1′–3′ long; fruit fully 2″ broad. 5. *G. Aparine.*
Cymes mostly several-flowered; leaves ½′–1′ long; fruit smaller. 6. *G. spurium.*
Flowers solitary in the axils, subtended by 2 foliaceous bracts; fruit bristly. 7. *G. virgatum.*

† † *Perennials.*

1. Fruit bristly-hispid (or becoming glabrous in no. 12).
   a. Leaves in 4's, 1-nerved. 8. *G. pilosum.*
   b. Leaves in 4's, 3-nerved.

Leaves lanceolate, oval, or ovate; flowers in open cymes.
Upper leaves lanceolate to ovate-lanceolate, acuminate. 9. *G. lanceolatum.*
Upper leaves ovate, oblong, oval, ovate-lanceolate or obovate, obtuse.
Corolla usually hirsute; plant mostly pubescent; leaves oblong to ovate-lanceolate. 10. *G. circaezans.*
Corolla glabrous; plant little pubescent; some leaves obovate. 11. *G. Kamtschaticum.*
Leaves linear to lanceolate; flowers in terminal panicles. 12. *G. boreale.*
   c. Leaves in 6's. 13. *G. triflorum.*
2. Fruit smooth and glabrous (warty in no. 15).
   a. Flowers brown-purple.
Leaves lanceolate, 3-nerved; fruit smooth. 14. *G. latifolium.*
Leaves narrowly lanceolate, 1-nerved; fruit warty. 15. *G. Arkansanum.*
   b. Flowers white, yellowish, or greenish.
Endosperm of seed annular in cross-section.
Corolla 4-parted, its lobes acute; stems smooth, or nearly so. 16. *G. tinctorium.*
Corolla mostly 3-parted, its lobes obtuse; stems minutely retrorse-hispid.
Pedicels slender, rough; leaves mostly in 4's. 17. *G. trifidum.*
Pedicels rather stout, smooth; leaves mostly in 5's and 6's. 18. *G. Claytoni.*

Endosperm of seed lunate in cross-section.
Leaves obtuse. 19. *G. palustre.*
Leaves acute, or cuspidate.
Stem nearly or quite smooth. 20. *G. concinnum*
Stem strongly retrorse-hisgid. 21. *G. asprellum.*
* * Fruit fleshy, resembling a double berry. 22. *G. hispidulum.*

1. Galium vèrum L. Yellow Bedstraw. Lady's Bedstraw. (Fig. 3408.)

Galium verum L. Sp. Pl. 107. 1753.

Perennial from a somewhat woody base, erect or ascending, simple or branched, 6′–2½° high. Stems smooth or minutely roughened; leaves in 6's or 8's, narrowly linear, 4″–12″ long, about ½″ wide, rough on the margins, at length deflexed; flowers yellow, the cymes in dense narrow panicles; fruit usually glabrous, less than 1″ broad.

In waste places and fields, Ontario, eastern New England, southern New York and New Jersey. Adventive or naturalized from Europe. Native also of Asia. May–Sept. Called also Cheese-rennet, Curdwort, Bedflower, Fleawort, Maids' Hair and Yellow Cleavers.

2. Galium Mollùgo L. Wild Madder. White, or Great Hedge Bedstraw. (Fig. 3409.)

Galium Mollugo L. Sp. Pl. 107. 1753.

Glabrous or nearly so throughout. Stems erect, or diffusely branched, 1°–3° long; leaves in 6's or 8's, oblanceolate or linear, cuspidate at the apex, 6″–15″ long, 1″–2″ wide, sometimes roughish on the margins; flowers small, white, very numerous in terminal panicled cymes; pedicels filiform; fruit smooth and glabrous, nearly 1″ broad.

In fields and waste places, Newfoundland to Vermont, New York, Pennsylvania, New Jersey and Delaware. Adventive or naturalized from Europe. Called also Whiptongue. May–Sept.

3. Galium Parisiénse L. Wall Bedstraw. (Fig. 3410.)

Galium parisiense L. Sp. Pl. 108. 1753.
Galium Anglicum Huds. Fl. Angl. Ed. 2, 69. 1778.

Annual, erect or ascending, very slender, much branched; stem rough on the angles, 6′–12′ high. Leaves in verticils of about 6 (4–7), linear or linear-lanceolate, cuspidate, minutely scabrous on the margins and midrib, 2″–4″ long; cymes several-flowered, axillary and terminal on filiform peduncles; flowers minute, greenish-white; fruit glabrous, finely granular, less than ½″ wide.

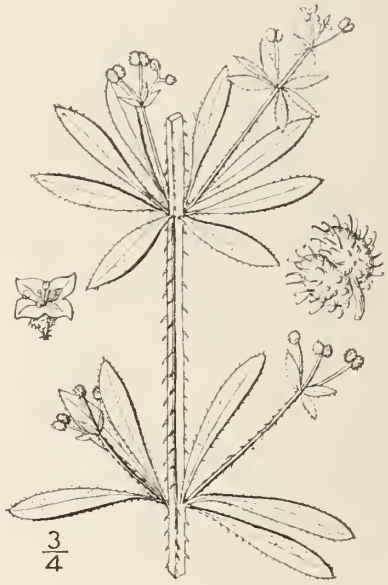
Along roadsides, Virginia. Adventive or naturalized from Europe. June–Aug.

4. Galium tricórne Stokes. Rough-fruited Corn Bedstraw. (Fig. 3411.)

Galium tricorne Stokes; With. Bot. Arr. Brit. Pl. Ed. 2, 1: 153. 1787.

Rather stout, decumbent or ascending, 6′–12′ high, simple, or little branched. Stem rough with reflexed prickles; leaves in 6's or 8's, linear or narrowly oblanceolate, 1′ long or less, 1½″–2″ wide, rough on the margins and midrib; peduncles axillary, shorter than the leaves; pedicels thickened and curved downward in fruit; cymes axillary, usually 3- (1–3-) flowered; fruit tuberculate or granular, not hispid, 4″–5″ broad.

In waste places or cultivated fields, eastward (according to Gray); Ontario, and in ballast about the eastern seaports. May–Aug.



5. Galium Aparìne L. Cleavers. Goose-grass. Cleaver-wort. (Fig. 3412.)

Galium Aparine L. Sp. Pl. 108. 1753.

Annual, weak, scrambling over bushes, 2°–5° long, the stems retrorsely hispid on the angles. Leaves in 6's or 8's, oblanceolate to linear, cuspidate at the apex, 1′–3′ long, 2″–5″ wide, the margins and midrib very rough; flowers in 1–3-flowered cymes in the upper axils; peduncles 5″–12″ long; fruiting pedicels straight; fruit 2″–3″ broad, densely covered with short hooked bristles.

In various situations, New Brunswick to Ontario, south to Florida, Missouri and Texas. Apparently naturalized from Europe. Widely distributed in temperate regions as a weed. May–Sept. Among some 70 other English names are Catchweed, Beggar-lice, Burhead, Clover-grass, Cling-rascal, Scratch-grass, Wild Hedge-burs, Hairif or Airif, Stick-a-back or Stickle-back, Gosling-grass, Goslingweed, Turkey-grass, Pigtail, Grip or Grip-grass, Loveman. Sweethearts.

6. Galium spùrium L. Lesser-Goose-grass or Cleavers. (Fig. 3413.)

Galium spurium L. Sp. Pl. 106. 1753.
Galium Vaillantii DC. Fl. France. 4: 263. 1805.
Galium Aparine var. *Vaillantii* Koch, Fl. Germ. 330 1837.

Similar to the preceding species but smaller, the stem equally rough-angled. Leaves smaller, 1′ in length or less, linear-oblong or slightly oblanceolate, cuspidate-pointed, rough on the margins and midrib; cymes 2–9-flowered; fruit 1″–1½″ broad, usually less hispid, sometimes smooth, or nearly so.

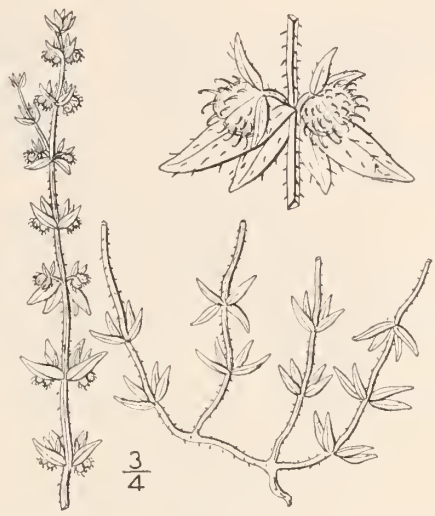
In low grounds, Ontario to British Columbia, south in the Rocky Mountains to Arizona and to California. Also in Europe, or the American plant may be distinct from the European. Called also Smooth-fruited Corn Bedstraw. May–Aug.

7. Galium virgàtum Nutt. Southwestern Bedstraw. (Fig. 3414.)

Galium virgatum Nutt.; T. & G. Fl. N. A. 2: 20. 1841.

Annual, 4′–12′ high, usually hispid, sometimes nearly glabrous; stem very slender, 4-angled, branched from the base, or simple. Leaves in 4's, oblong or linear-oblong, 2½″–5″ long, 1″ wide, or less, obtuse or acutish; peduncles axillary, 1-flowered, less than 1″ long, recurved in fruit; flower white, subtended by 2 large oblong to lanceolate bracts which closely resemble the leaves; fruit about 1″ in diameter, covered with slender barbed bristles.

Greene Co., Mo., probably introduced from the south; Arkansas to Louisiana and Texas. April–June.



8. Galium pilòsum Ait. Hairy Bedstraw. (Fig. 3415.)

Galium pilosum Ait. Hort. Kew. 1: 145. 1789.
Galium Bermudense L. Sp. Pl. 105. 1753?

Perennial, more or less hirsute-pubescent; stems ascending, branched, 1°–2½° long. Leaves in 4's, oval or oval-ovate, punctate, 1-nerved, obtuse, or obscurely 3-nerved at the base, mucronulate, 6″–12″ long, 3″–5″ wide, the lower usually smaller; peduncles axillary and terminal; cymes numerous but few-flowered; pedicels 1″–6″ long, flowers yellowish-purple; fruit dry, densely hispid, nearly 2″ in diameter.

In dry or sandy soil, eastern Massachusetts to Indiana, south to Florida and Texas. June–Aug.

Galium pilòsum puncticulòsum (Michx.) T. & G. Fl. N. A. 2: 24. 1841.

Galium puncticulosum Michx. Fl. Bor. Am. 1: 80. 1803.

Glabrous or nearly so; leaves smaller, ciliate. Southern New Jersey to Florida and Texas. Perhaps a distinct species.

9. Galium lanceolàtum Torr. Torrey's Wild Liquorice. (Fig. 3416.)

Galium circaezans var. *lanceolatum* Torr. Cat. Pl. N. Y. 23. 1819.
Galium lanceolatum Torr. Fl. U. S. 168. 1824.
Galium Torreyi Bigel. Fl. Bost. Ed. 2, 56. 1824.

Perennial, glabrous or nearly so, the stems minutely roughened, simple or often branched, 1°–2° high. Leaves in 4's, lanceolate or ovate-lanceolate, acutish or acuminate, 3-nerved, more or less ciliate on the margins and nerves, 1′–2½′ long, 5″–11″ wide, the lower smaller and obtuse or obtusish; cymes rather few-flowered, loose, widely branched; flowers sessile or very nearly so; corolla glabrous, yellowish green to purple, its lobes acuminate; fruit dry, hispid with long hairs, 2″–2½″ broad.

In dry woods, Quebec and Ontario to Minnesota, south to New Jersey, Pennsylvania and Michigan. Ascends to 4000 ft. in Virginia. June–Aug.

11. Galium Kamtscháticum Steller. Northern Wild Liquorice. (Fig. 3418.)

Galium Kamtschaticum Steller; R. & S. Mant. 3: 186. 1827.
Galium Littellii Oakes, Hovey's Mag. 7: 179. 1841.
Galium circaezans var. *montanum* T. & G. Fl. N. A. 2: 24. 1841.

Similar to the preceding species, but weak, smaller, stems 4′–15′ long. Leaves in 4's, broadly oval, orbicular, or obovate, thin, 3-nerved, obtuse, mucronulate, 6″–18″ long, 4″–12″ wide, glabrate, or pubescent with short scattered hairs on the upper surface and on the nerves beneath, sometimes ciliate; flowers few, all on pedicels 2″–6″ long; corolla glabrous, yellowish-green, its lobes acutish; fruit hispid, 2″ broad.

In mountainous regions, Quebec, northern New England and northern New York. Also in northeastern Asia. Summer.

10. Galium circaèzans Michx. Wild Liquorice. Cross-Cleavers. (Fig. 3417.)

G. circaezans Michx. Fl. Bor. Am. 1: 80. 1803.

Perennial, more or less pubescent, branched, 1°–2° high. Leaves in 4's, oval, ovallanceolate or ovate, obtuse or obtusish at the apex, 3-nerved, 6″–18″ long, 4″–8″ wide, usually somewhat pubescent on both surfaces, the lower smaller; cymes divaricately branched; flowers sessile or nearly so, greenish; corolla hirsute without, its lobes acute; fruit hispid, similar to that of the preceding species, at length deflexed.

In dry woods, Quebec and Ontario to Minnesota, Florida, Kansas and Texas. May-July.

Galium circaèzans glabèllum Britton, Mem. Torr. Club, 5: 303. 1894.

Foliage nearly or quite glabrous; corolla glabrous. New York.

12. Galium boreàle L. Northern Bedstraw. (Fig. 3419.)

Galium boreale L. Sp. Pl. 108. 1753.
Galium septentrionale R. & S. Syst. 3: 253. 1818.

Erect, perennial, smooth and glabrous, strict, simple, or branched, leafy, 1°–2½° high. Leaves in 4's, lanceolate or linear, 3-nerved, obtuse or acute, 1′–2½′ long, 1″–3″ wide, the margins sometimes ciliate; panicles terminal, dense, many-flowered, the flowers white in small compact cymes; fruit hispid, at least when young, sometimes becoming glabrate when mature, about 1″ broad.

In rocky soil or along streams, Quebec to Alaska, south to New Jersey, Pennsylvania, Michigan, Nebraska, New Mexico and California. Also in Europe and northern Asia. May-Aug.

13. Galium triflòrum Michx. Sweet-scented or Fragrant Bedstraw. (Fig. 3420.)

Galium triflorum Michx. Fl. Bor. Am. 1: 80. 1803.

Perennial, diffuse, procumbent, or ascending, glabrous or nearly so, shining, fragrant in drying, the stems and margins of the leaves sometimes a little roughened. Leaves in 6's, narrowly oval or slightly oblanceolate, 1-nerved, cuspidate at the apex, narrowed at the base, 1′–3½′ long, 2″–6″ wide; peduncles slender, terminal and axillary, often exceeding the leaves, 3-flowered or branched into 3 pedicels which are 1–3-flowered; flowers greenish; fruit 1½″–2″ broad, hispid with hooked hairs; seed almost spherical, the groove obsolete.

In woods, Nova Scotia to Alaska, south to Alabama, Louisiana, the Indian Territory, Colorado and California. Also in northern Europe, Japan and the Himalayas. June–Aug.

14. Galium latifòlium Michx. Purple Bedstraw. (Fig. 3421.)

Galium latifolium Michx. Fl. Bor. Am. 1: 79. 1803.

Perennial, erect, smooth and glabrous, branched, 1°–2° high. Leaves in 4's, lanceolate, 3-nerved, acuminate at the apex, narrowed or rounded at the base, 1′–2′ long, 4″–8″ wide, the midrib sometimes pubescent beneath, the margins minutely roughened, the lower smaller and sometimes opposite; peduncles axillary and terminal, slender, but usually shorter than the leaves; flowers purple; cymes loosely many-flowered, the pedicels slender, 2″–6″ long, smooth or very nearly so; fruit smooth, slightly fleshy, 2″ broad, usually only one of the carpels developing.

In dry woods in mountainous regions, Pennsylvania to Georgia. May–Aug.

15. Galium Arkansànum A. Gray. Arkansas Bedstraw. (Fig. 3422.)

Galium Arkansanum A. Gray, Proc. Am. Acad. 19: 80. 1883.

Similar to the preceding species but usually lower, the leaves linear-lanceolate, 6″–12″ long, 1″–3″ wide, the lateral nerves obscure or none, the midrib sometimes pubescent beneath, and the margins ciliate; fruiting pedicels roughish, 3″–12″ long; flowers brown-purple, the numerous cymes loosely several–many-flowered; fruit glabrous, warty, somewhat fleshy, each carpel 1″–1½″ in diameter.

Southern Missouri and Arkansas. June–July.

16. Galium tinctòrium L. Stiff Marsh Bedstraw. Wild Madder. (Fig. 3423.)

Galium tinctorium L. Sp. Pl. 106. 1753.
Galium trifidum var. *latifolium* Torr. Fl. N. & Mid. States, 78. 1826.
Galium obtusum Bigelow, Fl. Bost. Ed. 2, 55. 1824.

Perennial; stem erect, 6′–15′ high, rather stiff, branched almost to the base, the branches commonly solitary, strict (not irregularly diffuse), several times forked; stem 4-angled, nearly glabrous; leaves commonly in 4's, linear to lanceolate, ½′–1′ long; broadest below the middle, obtuse, cuneate at the base, dark green and dull, not papillose, 1-nerved, the margins and midrib roughish; flowers terminal in clusters of 2 or 3; pedicels slender, not much divaricate in fruit; corolla white, large, 1″–1¾″ broad, 4-parted, its lobes oblong, acute; disk large; fruit smooth; seed spherical, hollow, annular in cross-section.

Damp shady places, wet meadows and swamps, Canada to North Carolina and Tennessee, west to Michigan, Nebraska and Arizona. May-July.

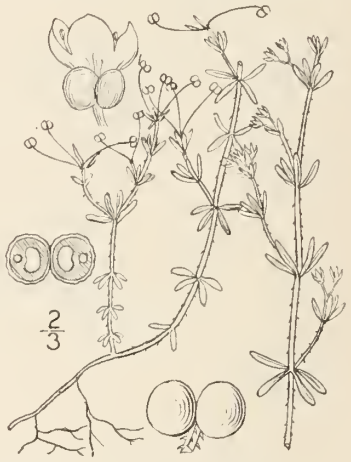
Galium tinctòrium filifòlium Wiegand, Bull. Torr. Club, 24: 397. 1897.

More slender than the type and often more diffuse; leaves almost filiform, 1″ wide or less, not broader below the middle, strongly cellular-papillose; inflorescence more open; pedicels slender; bracts minute; flowers in 2's or 3's; corolla larger. Sandy places in swamps, Virginia to Florida, along the coast.

Galium tinctòrium Labradòricum Wiegand, Bull. Torr. Club, 24: 398. 1897.

Low and strictly erect, 2′–10′ high; branches few, ascending, mostly from the upper nodes; stem as in the type; leaves small, 3″–4″ long, linear, reflexed; flowers large. In sphagnous bogs, Connecticut, New York and Wisconsin to Labrador.

17. Galium trífidum L. Small Bedstraw. Small Cleavers. (Fig. 3424.)



Galium trifidum L. Sp. Pl. 105. 1753.
G. trifidum var. *pusillum* A. Gray, Man. Ed. 5, 209. 1867.

Perennial by slender rootstocks, very slender and weak; stem ascending, 16′ long or less, much branched and intertangled; stem sharply 4-augled, rough; branches commonly in 2's; leaves in 4's, linear-spatulate, 2½″–7″ long, obtuse, cuneate at the base, 1-nerved, dark green and dull on both surfaces, scarcely papillose, the margins and midrib retrorse-scabrous; flowers small, on lateral or terminal pedicels which are capillary and much longer than the leaves, commonly two at each node or three terminal; corolla very small, white, ¼″ long, trifid, its lobes broadly oval, very obtuse; fruit glabrous; seed spherical and hollow, annular in cross-section.

Sphagnous bogs and cold swamps, Maine to southern New York, Ohio, Nebraska, Colorado and northward. Summer.

18. Galium Clàytoni Michx. Clayton's Bedstraw. (Fig. 3425.)

Galium Claytoni Michx. Fl. Bor. Am. 1; 78. 1803.
Galium tinctorium Bigelow, Fl. Bost. Ed. 2, 54. 1824.

Perennial; stem erect or ascending, more diffuse when old, 6′–2° high; stem slender or sometimes quite stout, sharply 4-angled, more or less rough, the diffuse branches in 2's; leaves of medium size, 4″–8″ long, commonly in 5's or 6's, linear-spatulate or spatulate-oblong, obtuse, cuneately narrowed into a short petiole, rather firm in texture, scabrous on the margin and midrib, dark green and dull above, not papillose, discolored in drying; flowers in clusters of 2's or 3's, terminal, provided with 1 or 2 minute bracts; pedicels straight, in fruit strongly divaricate, glabrous and rather stout; corolla minute, white, 3-parted, the lobes broadly oval, obtuse; fruit glabrous; seed spherical and hollow, annular in cross-section.

Swamps, Massachusetts and New York to North Carolina, Michigan, Missouri and Texas. May-July.

19. Galium palústre L. Marsh Bedstraw. (Fig. 3426.)

Galium palustre L. Sp. Pl. 105. 1753.
Galium trifidum var. *bifolium* Macoun, Cat. Can. Plants, 202. 1884?

Perennial, stem erect and rather slender, about 16′ high; internodes very long (middle one 2½′–3′ long); short branches mostly in 2's. Stem sharply 4-angled, glabrous or a little rough; leaves in typical specimens rather small, in 2's to 6's, linear-elliptic to spatulate, cuneate at the base, obtuse, 3″–8″ long, 1″–2″ wide, the rather firm margins and the midrib slightly scabrous, not papillose; flowers numerous in terminal and lateral cymes; bracteoles in the inflorescence minute; pedicels in flower ascending, 1½″–2½″ long, in fruit strongly divaricate; corolla large, white, 1″–1¾″ broad, 4-parted, the lobes oblong, acute; disk almost obsolete; fruit glabrous; endosperm of the seed grooved on the inner face, in cross-section lunate.

In damp shady or open places along roadsides and ditches, or in the margins of swamps. Newfoundland, Prince Edward Island and Quebec, to Massachusetts and New York. Also in Europe.

20. Galium concínnum Torr. & Gray. Shining Bedstraw. (Fig. 3427.)

Galium parviflorum Raf. Med. Rep. (II) 5: 360. 1808?
Galium concinnum T. & G. Fl. N. A. 2: 23. 1841.

Perennial, glabrous, shining, usually much branched, the angles of the stem and edges of the leaves minutely scabrous. Leaves usually all in 6's, linear or sometimes broader above the middle, narrowed at the base, blunt-pointed, or minutely cuspidate, 4″–6″ long, 1″–1½″ wide, green in drying; peduncles filiform; pedicels short; flowers minute, white, numerous in open cymes; fruit small, glabrous; endosperm deeply grooved.

In dry woodlands, western New Jersey to Virginia, west to Minnesota and Arkansas. June–Aug.

21. Galium aspréllum Michx. Rough Bedstraw. (Fig. 3428.)

Galium asprellum Michx. Fl. Bor. Am. 1: 78. 1803.

Perennial, weak, much branched and reclining on bushes, or sometimes erect; stem retrorsely hispid, 2°–6° long. Leaves in 6's or 5's, or those of the branches rarely in 4's, narrowly oval or slightly oblanceolate, cuspidate at the apex, narrowed at the base, sometimes so much so as to appear petioled, 4″–8″ long, 1″–2″ wide, their margins and midribs rough; cymes terminal and axillary, several–many-flowered; flowers white; fruit smooth and glabrous, about 1″ broad; endosperm with a shallow groove.

In moist soil, Newfoundland to western Ontario, south to North Carolina, Illinois, Wisconsin and Nebraska. Called also Pointed Cleavers. Ascends to 3500 ft. in the Adirandacks. June–Aug.

22. Galium hispídulum Michx. Coast Bedstraw. (Fig. 3429.)

Galium hispidulum Michx. Fl. Bor. Am. 1: 79. 1803.

Perennial, much branched, hirsute, hispid or nearly glabrous, 1°–2° high. Leaves in 4's, 1-nerved, oval, mucronate, rather thick, 3″–10″ long, 1½″–4″ wide, the margins more or less revolute in drying; flowers few, terminating the branchlets, white; pedicels 3″–4″ long, rather stout, becoming deflexed in fruit; fruit fleshy, minutely pubescent, about 2″ broad.

In dry or sandy soil, southern New Jersey to Florida and Georgia. May–Aug.

8. SHERÀRDIA L. Sp. Pl. 102. 1753.

Slender annual procumbent or diffuse herbs, with verticillate spiny-pointed leaves, and small nearly sessile pink or blue flowers, in terminal and axillary involucrate heads. Calyx-tube ovoid, its limb 4-6-lobed, the lobes lanceolate, persistent. Corolla funnelform, 4–5-lobed, the tube as long as the lobes or longer. Stamens 4 or 5, inserted on the tube of the corolla; filaments slender; anthers linear-oblong, exserted. Ovary 2-celled; style 2-cleft at the summit; ovules 1 in each cavity. Fruit didymous, the carpels indehiscent. Seed erect. [Named for Dr. Wm. Sherard, 1659–1728, patron of Dillenius.]

A monotypic genus of the Old World.

1. Sherardia arvénsis L. Blue Field Madder. Herb Sherard. Spurwort. (Fig. 3430.)

Sherardia arvensis L. Sp. Pl. 102. 1753.

Tufted, roughish, stems numerous, prostrate, ascending, or decumbent, 3′–10′ long. Leaves in 4's, 5's or 6's, the upper linear or lanceolate, acute and sharp-pointed, rough-ciliate on the margins, 3″–8″ long, 1″–2″ wide, the lower often obovate, mucronate; flowers in slender-peduncled involucrate heads, the involucre deeply 6–8-lobed, the lobes lanceolate, sharp-pointed; corolla-lobes spreading; fruit crowned with the 4–6 lanceolate calyx-teeth.

In waste places, Ontario and eastern Massachusetts. Also in Bermuda. Adventive from Europe. June–July.

9. ASPÉRULA L. Sp. Pl. 103. 1753.

Erect or ascending branching perennial herbs, with 4-angled stems, verticillate leaves, and small white pink or blue flowers in terminal or axillary, mostly cymose clusters. Calyx-tube somewhat didymous, the limb obsolete. Corolla funnelform, 4-lobed. Stamens 4, inserted on the tube or throat of the corolla; anthers linear or oblong. Ovary 2-celled; ovules 1 in each cavity; style 2-cleft. Fruit globose-didymous, the carpels indehiscent. Seed adherent to the pericarp; endosperm fleshy; embryo curved. [Latin diminutive of *asper*, rough, referring to the leaves.]

About 80 species, natives of the Old World.

1. Asperula odoràta L. Sweet Woodruff. (Fig. 3431.)

Asperula odorata L. Sp. Pl. 103. 1753.

Stems erect, slender, smooth. Leaves usually in 8's (6's–9's), thin, oblong-lanceolate, acute or obtuse, mucronate, 1-nerved, roughish on the margins, 6″–18″ long, the lower smaller, often obovate or oblanceolate; peduncles terminal and axillary, slender; cymes several-flowered; flowers white or pinkish, 1½″ long; pedicels 1″–2″ long; fruit very hispid, about 1″ broad.

In waste places, New Brunswick, N. J. Fugitive from Europe. Other English names are Hay-plant, Mugwet or Mugget, Rockweed, Sweet Hairhoof, Woodrip, Woodrowel, Star-grass, and Sweet-grass. May–July.

Asperula arvénsis L., another European species, with terminal capitate flowers, and linear obtuse leaves, has been found in waste places on Staten Island.

Family 35. CAPRIFOLIÀCEAE Vent. Tabl. 2: 593. 1799.

HONEYSUCKLE FAMILY.

Shrubs, trees, vines, or perennial herbs, with opposite simple or pinnate leaves, and perfect, regular or irregular, mostly cymose flowers. Stipules none, or sometimes present. Calyx-tube adnate to the ovary, its limb 3–5-toothed or 3–5-lobed. Corolla gamopetalous, rotate, campanulate, funnelform, urn-shaped, or tubular, the tube often gibbous at the base, the limb 5-lobed, sometimes 2-lipped. Stamens 5 (very rarely 4), inserted on the tube of the corolla and alternate with its lobes; anthers oblong or linear, versatile. Ovary inferior, 1–6-celled; style slender; stigma capitate, or 2–5-lobed, the lobes stigmatic at the summit; ovules anatropous, 1 or several in each cavity. Fruit a 1–6-celled berry, drupe, or capsule. Seeds oblong, globose, or angular; seed-coat membranous or crustaceous, smooth or cancellate; embryo usually small, placed near the hilum; radicle terete; cotyledons ovate.

About 10 genera and 260 species, mostly natives of the northern hemisphere, a few in South America and Australia.

Corolla rotate or urn-shaped; flowers in compound cymes; style deeply 2–5-lobed; shrubs or trees.
- Leaves pinnate; drupe 3–5-seeded. — 1. *Sambucus.*
- Leaves simple; drupe 1-seeded. — 2. *Viburnum.*

Corolla tubular or campanulate, often 2-lipped; style slender.
- Erect perennial herbs; leaves connate. — 3. *Triosteum.*
- Creeping, somewhat woody herb; flowers long-peduncled, geminate. — 4. *Linnaea.*
- Shrubs or vines.
  - Fruit a few-seeded berry.
    - Corolla short, campanulate, regular, or nearly so. — 5. *Symphoricarpos.*
    - Corolla more or less irregular, tubular or campanulate. — 6. *Lonicera.*
  - Fruit a 2-celled capsule; corolla funnelform. — 7. *Diervilla.*

1. SAMBÙCUS L. Sp. Pl. 269. 1753.

Shrubs or trees (or some exotic species perennial herbs), with opposite pinnate leaves, serrate or laciniate leaflets, and small white or pinkish flowers in compound depressed or thyrsoid cymes. Calyx-tube ovoid or turbinate, 3–5-toothed or 3–5-lobed. Corolla rotate or slightly campanulate, regular, 3–5-lobed. Stamens 5, inserted at the base of the corolla; filaments slender; anthers oblong. Ovary 3–5-celled; style short, 3-parted; ovules 1 in each cavity, pendulous. Drupe berry-like, containing 3–5, 1-seeded nutlets. Endosperm fleshy; embryo nearly as long as the seed. [Latin name of the elder.]

About 20 species, of wide geographic distribution. In addition to the following, 3 others occur in western North America.

- Cyme convex; fruit purplish black. — 1. *S. Canadensis.*
- Cyme thyrsoid-paniculate, longer than broad; fruit red. — 2. *S. pubens.*

1. Sambucus Canadénsis L. American Elder. Sweet Elder. (Fig. 3432.)

Sambucus Canadensis L. Sp. Pl. 269. 1753.

A shrub, 4°–10° high, glabrous or very nearly so throughout, the stems but little woody, the younger ones with large white pith. Leaflets 5–11, usually 7, ovate or oval, acuminate or acute at the apex, short-stalked, glabrous above, sometimes slightly pubescent on the veins beneath, 2′–5′ long, sharply serrate, sometimes stipellate; cymes convex, broader than high; flowers white, about 1½″ broad; drupe deep purple or black, nearly 3″ in diameter; nutlets roughened.

In moist soil, New Brunswick and Nova Scotia to Florida, west to Manitoba, Kansas, Texas and Arizona. Ascends to 4000 ft. in North Carolina. Called also Elder-blow, Elder-berry. The flowers and fruit have strong medicinal properties. Leaves heavy-scented when crushed, those of young shoots often stipulate. June–July.

2. Sambucus pùbens Michx. Red-berried Elder. (Fig. 3433.)

Sambucus pubens Michx. Fl. Bor. Am. 1: 181. 1803.

A shrub, 2°–12° high, the twigs and leaves commonly pubescent; stems woody, the younger with reddish-brown pith. Leaflets 5–7, ovate-lanceolate or oval, acuminate at the apex, often narrowed and usually inequilateral at the base, 2′–5′ long, not stipellate, sharply serrate; cymes thyrsoid, longer than broad; flowers whitish, turning brown in drying; drupe scarlet or red, 2″–3″ in diameter; nutlets very minutely roughened.

In rocky places, New Brunswick to British Columbia, Georgia, Colorado and California. Fruit rarely white. April–May. Called also Mountain Elder. Ascends to 5000 ft. in Virginia.

Sambucus pùbens dissécta Britton, Mem. Torr. Club, 5: 304. 1894.

Leaflets laciniate. Lake Superior and Pennsylvania.

Sambucus nìgra laciniàta (Mill.) DC., a cut-leaved variety of the related European species, has been found at Cape May, N. J., perhaps escaped from cultivation.

2. VIBÚRNUM L. Sp. Pl. 267. 1753.

Shrubs or trees, with entire dentate or lobed, sometimes stipulate leaves, and white or rarely pink flowers in compound cymes, the outer flowers sometimes radiant and neutral. Calyx-tube ovoid or turbinate, its limb short, 5-toothed. Corolla rotate or short-campanulate in our species, regular, 5-lobed. Stamens 5, inserted on the tube of the corolla; anthers oblong, exserted. Ovary 1–3-celled; style short, 3-lobed or 3-parted; ovules solitary in each cavity, pendulous. Drupe ovoid or globose, sometimes flattened, 1-seeded. Seed compressed; endosperm fleshy; embryo minute. [The ancient Latin name.]

About 100 species, of wide geographic distribution. Besides the following, about 5 others occur in the southern and western parts of North America.

* Outer flowers of the cyme large, radiant; drupe red.

Leaves doubly serrate, pinnately veined. 1. *V. alnifolium.*
Leaves 3-lobed, palmately veined. 2. *V. Opulus.*

* * None of the flowers radiant; drupe blue or black (red in no. 3).

1. Leaves palmately veined, or 3-ribbed.

Cymes ½′–1′ broad, the rays short; drupe red. 3. *V. pauciflorum.*

Cymes 1½′–2½′ broad, the rays slender; drupe nearly black. 4. *V. acerifolium.*

2. Leaves pinnately veined.

a. Leaves coarsely dentate, the veins prominent beneath.

Leaves very short-petioled, pubescent. 5. *V. pubescens.*

Petioles 3″–20″ long.

Leaves glabrous, or with tufts of hairs in the axils beneath. 6. *V. dentatum.*

Leaves pubescent beneath, the pubescence more or less stellate.

Drupe globose-ovoid; eastern. 7. *V. molle.*

Drupe oblong, twice as long as thick; western. 8. *V. Demetrionis.*

b. Leaves entire, crenulate, or serrulate, the veins not prominent.

Cymes manifestly peduncled.

Peduncle shorter than the cyme; leaves crenulate. 9. *V. cassinoides.*

Peduncle equalling or longer than the cyme; leaves mostly entire. 10. *V. nudum.*

Cymes sessile, or nearly so.

Leaves slender-petioled, large.

Leaves prominently acuminate. 11. *V. Lentago.*

Leaves obtuse, or merely acute.

Leaves and scarcely winged petioles glabrous, or nearly so. 12. *V. prunifolium.*

Veins of lower leaf-surfaces and winged petioles tomentose. 13. *V. rufotomentosum.*

Leaves nearly sessile, obovate, small. 14. *V. obovatum.*

1. Viburnum alnifòlium Marsh. Hobble-bush. American Warfaring Tree. (Fig. 3434.)

V. alnifolium Marsh. Arb. Am. 162. 1785.
Viburnum lantanoides Michx. Fl. Bor. Am. 1: 179. 1803.

A shrub, with smooth purplish bark, sometimes reaching a height of 10°, widely and irregularly branching, the branches often procumbent, the youngest twigs scurfy. Leaves orbicular, or very broadly ovate, strongly pinnately veined, short-acuminate or acute at the apex, usually cordate at the base, finely stellate-pubescent, or at length glabrous above, scurfy with stellate pubescence on the veins beneath, finely serrate all around, 3′–8′ broad; petioles ½′–1½′ long; cymes sessile, 3′–5′ broad, the exterior flowers usually radiant and neutral, about 1′ broad; drupes red, becoming purple, ovoid-oblong, 5″–6″ long; stone 3-grooved on one side, 1-grooved on the other.

In low woods, New Brunswick to North Carolina, western New York and Michigan. Leaves of shoots from cut stumps thin, ovate, coarsely toothed. May–June.

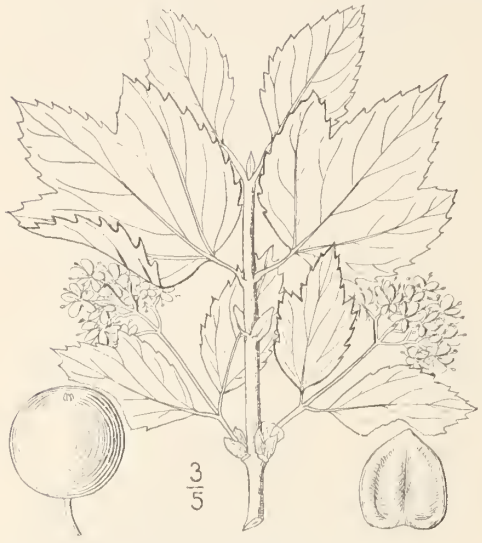
2. Viburnum Ópulus L. Cranberry-tree. Wild Guelder-rose. High Bush-cranberry. (Fig. 3435.)

Viburnum Opulus L. Sp. Pl. 268. 1753.
V. trilobum Marsh. Arb. Am. 162. 1785.

A shrub sometimes 12° high, with nearly erect smooth branches. Leaves broadly ovate, sometimes broader than long, glabrous, or with scattered hairs above, more or less pubescent on the veins beneath, rather deeply 3-lobed, rounded or truncate and 3-ribbed at the base, the lobes divergent, acuminate, coarsely dentate; petioles ½′–1′ long, glandular above; cymes peduncled, 3′–4′ in diameter, the exterior flowers radiant, neutral, ½′–1′ broad; drupes globose, or oval, 4″–5″ in diameter, red, very acid, translucent; stone orbicular, flat, not grooved.

In low grounds, New Brunswick to British Columbia, south to New Jersey, Michigan and Oregon. Also in Europe and Asia. Among many English names are Marsh-, Rose-, or Water-elder, White Dogwood, Whitten-tree, Dog Rowan-tree, Gaiter-tree or Gat-

ten, Cherry-wood, May Rose, Squaw-bush, Cramp-bark. In cultivation, the Snowball. June-July.



3. Viburnum pauciflòrum Pylaie. Few-flowered Cranberry-tree. (Fig. 3436.)

Viburnum pauciflorum Pylaie; T. & G. Fl. N. A. 2: 17. 1841.
Viburnum Opulus var. *eradiatum* Oakes, Hovey's Mag. 7: 183. 1841.

A straggling shrub, 2°–6° high, with twigs and petioles glabrous or nearly so. Leaves broadly oval, obovate, or broader than long, 5-ribbed, truncate or somewhat cordate at the base, mostly with 3 rather shallow lobes above the middle, coarsely and unequally dentate, glabrous above, more or less pubescent on the veins beneath, 1½′–3′ broad; cymes peduncled, short-rayed, ½′–1′ broad; flowers all perfect and small; drupes globose to ovoid, light red, acid, 4″–5″ long; stone flat, orbicular, scarcely grooved.

In cold mountain woods, Newfoundland to Alaska, south to Maine, New Hampshire, Vermont, Pennsylvania, in the Rocky Mountains to Colorado, and to Washington. June-July.

4. Viburnum acerifòlium L. Maple-leaved Arrow-wood. Dockmakie. (Fig. 3437.)

V. acerifolium L. Sp. Pl. 268. 1753.

A shrub, 3°–6° high, with smooth gray slender branches, and somewhat pubescent twigs and petioles. Leaves ovate, orbicular, or broader than long, cordate or truncate at the base, pubescent on both sides, or becoming glabrate, 2′–5′ broad, mostly rather deeply 3-lobed, coarsely dentate, the lobes acute or acuminate; petioles ½′–1′ long; cymes long-peduncled, 1½′–3′ broad; flowers all perfect, 2″–3″ broad; drupe nearly black, 3″–4″ long, the stone lenticular, faintly 2-ridged on one side and 2-grooved on the other.

In dry or rocky woods, New Brunswick to North Carolina, west to Ontario, Michigan and Minnesota. May–June.

5. Viburnum pubéscens (Ait.) Pursh. Downy-leaved Arrow-wood. (Fig. 3438.)

Viburnum dentatum var. *pubescens* Ait. Hort. Kew. 1: 372. 1789.
V. pubescens Pursh, Fl. Am. Sept. 202. 1814.

A branching shrub, 2°–5° high with straight and slender gray branches. Leaves sessile, or on petioles less than 3″ long, ovate or oval, rounded or slightly cordate at the base, acute or acuminate at the apex, coarsely dentate, 1½′–3′ long, densely velvety-pubescent beneath, glabrous, or with scattered hairs above, or rarely glabrate on both surfaces; cymes peduncled, 1½′–2½′ broad, the flowers all perfect; drupes oval, nearly black, about 4″ long; stone slightly 2-grooved on both faces.

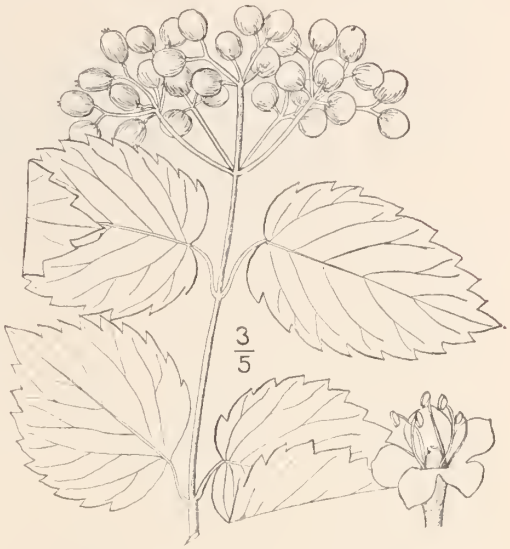
In rocky woods, Quebec and Ontario to Manitoba, south, especially along the Alleghanies to Georgia and to Illinois, Iowa and Michigan. June–July. A form of this species, or a related plant, with petioles ½′ long or more, occurs in Missouri.

6. Viburnum dentàtum L. Arrow-wood. (Fig. 3439.)

Viburnum dentatum L. Sp. Pl. 268. 1753.

A shrub with slender glabrous gray branches, sometimes reaching a height of 15°. Twigs and petioles glabrous; petioles 3″–12″ long; leaves ovate, broadly oval or orbicular, rounded or slightly cordate at the base, acute or short-acuminate at the apex, prominently pinnately veined, coarsely dentate all around, 1½′–3′ broad, glabrous on both sides, or sometimes pubescent with simple hairs in the axils of the veins beneath; cymes long-peduncled, 2′–3′ broad; flowers all perfect; drupe globose-ovoid, about 3″ in diameter, blue, becoming nearly black; stone rather deeply grooved on one side, rounded on the other.

In moist soil, New Brunswick to Ontario, south along the mountains to Georgia and to western New York, Michigan and Minnesota. Called also Mealy-tree. May–June.



7. Viburnum mólle Michx. Soft-leaved Arrow-wood. (Fig. 3440.)

Viburnum molle Michx. Fl. Bor. Am. 1: 180. 1803.

Similar to the preceding species but the twigs, petioles, rays of the cyme and lower surfaces of the leaves more or less densely stellate-pubescent; petioles short and stouter; leaves usually larger, crenate or dentate, commonly somewhat pubescent above; drupe globose-ovoid, blue, 4″ in diameter, its stone similar to that of *V. dentatum*.

Eastern Massachusetts to New Jersey, near the coast, south to Florida and Texas. Said to bloom later than *V. dentatum*.

8. Virburnum Demetriònis Deane & Robinson. Demetrio's Viburnum. (Fig. 3441.)

Viburnum Demetrionis Deane & Robinson, Bot. Gaz. 22: 167. *pl. 8.* 1896.

A shrub about 12° high, the older twigs ash gray, or at length grayish black and rough with lenticels, the bark exfoliating. Bud-scales acutish, ciliolate; leaves broadly ovate or nearly orbicular, short-acuminate at the apex, cordate or truncate at the base, 3′–5′ long, coarsely dentate, glabrous and bright green above, soft-pubescent and paler beneath, some of the pubescence stellate; petioles 8″–20″ long, channeled; stipules linear-filiform, 2″–5″ long; cymes terminal, peduncled, 4–7-rayed, glandular-puberulent; calyx-teeth ciliate; drupe oblong, obtuse at both ends, about 5″ long and 2½″ broad, much flattened, with 2 grooves when dry.

Bluffs, Benton Co., Missouri. Flowers not seen nor described.

9. Viburnum cassinoides L. Withe-rod. Appalachian Tea. (Fig. 3442.)

Viburnum cassinoides L. Sp. Pl. Ed. 2, 384. 1762.
Viburnum nudum var. *cassinoides* T. & G. Fl. N. A. 2: 14. 1841.

A shrub, 2°–12° high, with ascending gray branches, the twigs somewhat scurfy, or glabrous. Leaves ovate or oval, thick, pinnately veined, narrowed or sometimes rounded at the base, acute or blunt-acuminate at the apex, 1′–3′ long, generally crenulate, rarely entire, glabrous or very nearly so on both sides; peduncle shorter than or equalling the cyme; drupe pink, becoming dark blue, globose to ovoid, 3″–5″ long; stone round or oval, flattened.

In swamps and wet soil, Newfoundland to Manitoba and Minnesota, New Jersey and the mountains of North Carolina. June-July.

10. Viburnum nùdum L. Larger Withe-rod. (Fig. 3443.)

Viburnum nudum L. Sp. Pl. 268. 1753.
Viburnum nudum var. *Claytoni* T. & G. Fl. N. A. 2: 14. 1841.

Similar to the preceding species, but usually a larger shrub, sometimes 15° high. Leaves oval, oval-lanceolate, or obovate, entire or obscurely crenulate, mostly larger (sometimes 9′ long), narrowed at the base, acute or obtuse at the apex, more prominently veined, sometimes scurfy on the upper surface; peduncle equalling or exceeding the cyme.

In swamps, Long Island to Florida, west to Kentucky and Louisiana. Blooms a little later than the preceding species.

11. Viburnum Lentàgo L. Nanny-berry. Sheep-berry. Sweet Viburnum. (Fig. 3444.)

Viburnum Lentago L. Sp. Pl. 268. 1753.

A shrub, or often a small tree, sometimes 30° high, and with a trunk diameter of 10′. Winter buds acuminate, glabrous; leaves slender-petioled, ovate, mostly rounded at the base, acuminate at the apex, 2′–4′ long, glabrous on both sides, or rarely a little pubescent beneath, sharply serrulate; petioles often broadened and wavy-margined, 9″–12″ long; cyme sessile, several-rayed, 2′–5′ broad; drupes oval, bluish-black with a bloom, 5″–6″ long; stone very flat, circular or oval.

In rich soil, Hudson Bay to Manitoba, south to New Jersey, along the Alleghanies to Georgia, and to Indiana and Missouri. Wood orange-brown, hard; weight 45 lbs. to the cubic foot. Fruit sweet, edible. May. Fruit ripe in October. Called also Nanny-bush, Black Thorn.

12. Viburnum prunifòlium L. Black Haw. Stag-bush. Sloe. (Fig. 3445.)

Viburnum prunifolium L. Sp. Pl. 268. 1753.

A shrub or small tree somewhat similar to the preceding species; but the winter buds smaller, less acute, often reddish-pubescent. Leaves shorter-petioled, ovate or broadly oval, obtuse or acutish but not acuminate at the apex, narrowed or rounded at the base, 1′–3′ long, finely serrulate, glabrous or nearly so; petioles rarely margined; cyme sessile, several-rayed, 2′–4′ broad; drupe oval, bluish-black and glaucous, 4″–5″ long; stone very flat on one side, slightly convex on the other, oval.

In dry soil, Connecticut to Florida, west to Michigan, Kansas and Texas. Wood hard, reddish-brown; weight per cubic foot 52 lbs. April-June. Fruit ripe in September, sweet and edible.

Viburnum prunifòlium globòsum Nash, Bull. Torr. Club, 20: 70. 1893.

Drupe globose, about 3′ in diameter; cymes smaller; flowers expanding before the leaves. New Jersey and eastern Pennsylvania.

13. Viburnum rufotomentòsum Small. Southern Black Haw. (Fig. 3446.)

Viburnum prunifolium var. *ferrugineum* T. & G. Fl. N. A. 2: 15. 1841. Not *V. ferrugineum* Raf. 1838.

Viburnum rufotomentosum Small, Bull. Torr. Club, 23: 410. 1896.

A small tree, becoming 20° high. Leaves elliptic to obovate, mostly obtuse at the apex, finely and sharply serrate or serrulate, narrowed or obtuse at the base, the veins brown-tomentose beneath; petioles 3″–8″ long, winged, brown-tomentose; cymes large, sessile, or very short-peduncled, the principal rays 3–5, mostly 4; flowers 3″–3½″ broad; drupe oval, 5″–7″ long, blue with a bloom; seed nearly orbicular.

In woods and thickets, Virginia to Illinois, Florida and Texas. Ascends to 3500 ft. in Virginia. April-May. Fruit ripe Aug.–Sept.

14. Viburnum obovàtum Walt. Small Viburnum. (Fig. 3447.)

Viburnum obovatum Walt. Fl. Car. 116. 1788.

A shrub, 2°–8° high, the twigs, petioles and rays of the cyme slightly pubescent, or at length glabrate. Leaves obovate, oblanceolate or spatulate, obtuse or retuse at the apex, short-petioled, glabrous or very nearly so on both sides, entire, or obscurely crenate toward the apex, small, ½′–1½′ long; cymes sessile, 3–5-rayed, 1′–2′ broad; drupe oval, black, 3″–4″ long; stone lenticular, slightly furrowed on both sides.

In swamps and along streams, Virginia (according to Gray) to Florida near the coast. April-May.

3. TRIÓSTEUM L. Sp. Pl. 176. 1753.

Perennial herbs, with simple terete stems and opposite connate-perfoliate or sessile leaves narrowed below the middle. Flowers axillary, perfect, solitary or clustered, sessile, yellowish, green, or purplish, 2-bracted. Calyx-tube ovoid, its limb 5-lobed, the lobes elongated, persistent and sometimes foliaceous in our species. Corolla-tube narrow or campanulate, gibbous at the base, the limb oblique, unequally lobed. Stamens 5, inserted on the corolla-tube; filaments very short; anthers linear, included. Ovary 3–5-celled; ovules 1 in each cavity; style filiform; stigma 3–5-lobed. Drupe coriaceous, orange or red, enclosing 2–3 (rarely 4–5) 1-seeded nutlets. Endosperm fleshy; embryo minute. [Greek, three-bone, from the 3 bony nutlets.]

Five known species, the following of eastern North America, two Japanese, one Himalayan.

Leaves ovate or oval; flowers purplish. 1. *T. perfoliatum.*
Leaves lanceolate or oval-lanceolate; flowers yellowish. 2. *T. angustifolium.*

1. Triosteum perfoliàtum L. Fever-wort. Horse-Gentian. (Fig. 3448.)

Triosteum perfoliatum L. Sp. Pl. 176. 1753.

Stem erect, stout, finely glandular-pubescent, or sometimes hirsute, 2°–4° high. Leaves ovate to broadly oval, 4′–9′ long, 2′–4′ wide, acute or acuminate at the apex, abruptly or gradually narrowed at the base, sessile, or connate-perfoliate, soft-pubescent beneath, somewhat hairy above, the margins entire or sinuate; bracts linear; corolla purplish-brown, 6″–10″ long, viscid-pubescent, about the length of the calyx-lobes; filaments bearded; drupe 4″–6″ long, obovoid-globose, orange-red, densely and finely pubescent; nutlets usually 3.

In rich soil, Quebec and Ontario to Minnesota, south to Alabama, Kentucky and Kansas. Called also Fever-root, Wild or Wood Ipecac, Tinker's-weed, Wild Coffee, Horse-Ginseng, White Gentian. Ascends 3000 ft. in Virginia. May–July.

2. Triosteum angustifòlium L. Yellow or Narrow-leaved Horse-Gentian. (Fig. 3449.)

Triosteum angustifolium L. Sp. Pl. 176. 1753.

Resembling the preceding species, but the stem slender and hirsute-pubescent, 1°–3° hi . Leaves lanceolate or oval-lanceolate, acute or acuminate at the apex, 3′–5′ long, ½′–1½′ wide, rough-pubescent, tapering to the sessile base, or the lower smaller, obtuse and spatulate; corolla yellowish, 6″–7″ long; flowers commonly solitary in the axils.

In rich soil, Connecticut and Long Island, to New Jersey, Pennsylvania, Virginia, Alabama, Illinois and Louisiana. May–Aug.

4. LINNAÈA L. Sp. Pl. 631. 1753.

Creeping, somewhat woody herbs, with opposite evergreen petioled obovate or orbicular leaves, and perfect pink or purplish flowers borne in pairs at the summit of elongated terminal peduncles. Calyx-tube ovoid, the limb 5-lobed. Corolla tubular-campanulate, regular, 5-lobed, the lobes imbricate. Stamens 4, inserted near the base of the corolla-tube, didynamous, included. Ovary 3-celled, 2 of the cavities with several abortive ovules, the other with 1 perfect pendulous ovule. Fruit nearly globose, 3-celled, 2 of the cells empty, the other with a single oblong seed. Endosperm fleshy; embryo cylindric. [Named by Gronovius for Linnæus, with whom the plant was a favorite.]

A monotypic genus of the north temperate zone.

1. Linnaea boreàlis L. Twin-flower. Ground-vine. (Fig. 3450.)

Linnaea borealis L. Sp. Pl. 631. 1753.

Branches slender, slightly pubescent, trailing, 6′–2° long. Petioles 1″–2″ long; leaves obscurely crenate, thick, 3″–10″ wide, sometimes wider than long; peduncles slender, erect, 2-bracted at the summit, 2-flowered (or rarely proliferously 4-flowered); pedicels filiform, 3″–10″ long, 2-bracteolate at the summit; flowers nodding, 4″–6″ long, fragrant; ovary subtended by a pair of ovate glandular scales which are connivent over the fruit or adnate to it.

In cold woods, mountains of Maryland, New Jersey, Long Island, north to Newfoundland, west through British America to Alaska and Vancouver, south to Michigan, in the Rocky Mountains to Colorado and in the Sierra Nevada to California. Also in northern Europe and Asia. June–Aug.

5. SYMPHORICÀRPOS Juss. Gen. 211. 1789.

Shrubs, with opposite deciduous short-petioled simple leaves, and small white or pink, perfect flowers, in axillary or terminal clusters. Calyx-tube nearly globular, the limb 4–5-toothed. Corolla campanulate or salverform, regular, or sometimes gibbous at the base, 4–5-lobed, glabrous or pilose in the throat; stamens 4 or 5, inserted on the corolla. Ovary 4-celled, 2 of the cavities containing several abortive ovules, the other two each with a single suspended ovule; style filiform; stigma capitate, or 2-lobed. Fruit an ovoid or globose 4-celled 2-seeded berry. Seeds oblong; endosperm fleshy; embryo minute. [Greek, fruit borne together, from the clustered berries.]

About 10 species, natives of North America and the mountains of Mexico. Known as St. Peter's-wort.

Fruit white; style glabrous.
- Stamens and style included; clusters usually few-flowered.
  - Erect shrub; leaves 1′–2′ long; clusters several-flowered. — 1. *S. racemosus.*
  - Diffuse shrub; leaves ½′–1′ long; clusters 1–2-flowered. — 2. *S. pauciflorus.*
- Stamens and style somewhat exserted; clusters many-flowered. — 3. *S. occidentalis.*

Fruit red; style bearded. — 4. *S. Symphoricarpos.*

1. Symphoricarpos racemòsus Michx. Snowberry. (Fig. 3451.)

Symphoricarpos racemosus Michx. Fl. Bor. Am. 1: 107. 1803.

An erect shrub, 6°–4° high, glabrous or nearly so, the branches slender. Petioles about 2″ long; leaves oval, obtuse at each end, sometimes a little pubescent beneath, 1′–2′ long, entire, undulate, or those of young shoots sometimes dentate; axillary clusters few-flowered, the terminal one mostly interruptedly spicate; corolla campanulate, about 3″ long, slightly gibbous at the base, bearded within; style glabrous; stamens and style included; berry snow-white, globose, loosely cellular, 3″–5″ in diameter.

In rocky places and on river shores, Nova Scotia to British Columbia, south to Pennsylvania, Kentucky, Minnesota and in California. Commonly planted and sometimes escaped from cultivation. Called also Snowdrop-berry, Egg-plant. June–Sept.

2. Symphoricarpos pauciflòrus (Robbins) Britton. Low Snowberry. (Fig. 3452.)

Symphoricarpos racemosus var. *pauciflorus* Robbins; A. Gray, Man. Ed. 5. 203. 1867.

Symphoricarpos pauciflorus Britton, Mem. Torr. Club, 5: 305. 1894.

A low spreading diffusely branched shrub, 6′–10′ high. Leaves broadly oval to orbiculate, entire, softly pubescent, especially along the veins, beneath, 6″–12″ long; flowers 2″–3″ long, solitary in the upper axils and 2 or 3 in the terminal spike; corolla campanulate, 5-lobed, bearded within; stamens and glabrous style included; berry oval when young, becoming globose, white, 2″–3″ in diameter.

In rocky places, Ontario and Vermont to western New York and Pennsylvania, west to South Dakota, British Columbia, south in the Rocky Mountains to Colorado. June–July.

3. Symphoricarpos occidentàlis Hook. Wolfberry. (Fig. 3453.)

Symphoricarpos occidentalis Hook. Fl. Bor. Am. 1: 285. 1833.

Similar to *S. racemosus* but stouter, with larger leaves 1′–3′ long, more or less pubescent beneath, entire, or often undulate-crenate; petioles 2″–3″ long; axillary clusters spicate, many-flowered, 6″–12″ long; corolla campanulate, 3″ long, lobed to beyond the middle; stamens and glabrous style somewhat exserted; berry nearly globular, white, 4″–5″ in diameter.

Michigan and Minnesota to British Columbia, Kansas and Colorado. June–July.

4. Symphoricarpos Symphoricàrpos (L.) MacM. Coral-berry. Indian Currant. (Fig. 3454.)

Lonicera Symphoricarpos L. Sp. Pl. 175. 1753.

S. orbiculata Moench, Meth. 503. 1794.

Symphoricarpos vulgaris Michx. Fl. Bor. Am. 1: 106. 1803.

Symphoricarpos Symphoricarpos MacM. Bull. Torr. Club, 19: 15. 1892.

A shrub, 2°–5° high, the branches erect or ascending, purplish, usually pubescent. Petioles 1″–2″ long; leaves oval or ovate, entire or undulate, mostly obtuse at each end, glabrous or nearly so above, usually soft-pubescent beneath, 1′–1½′ long; clusters dense, many-flowered, at length spicate, shorter than the leaves; corolla campanulate, sparingly pubescent within, pinkish, about 2″ long; style bearded; stamens included; berry purplish red, ovoid-globose, 1½″–2″ long.

Along rivers and in rocky places, banks of the Delaware in New Jersey and Pennsylvania, west to western New York and Dakota, and south to Georgia and Texas. Also sparingly escaped from cultivation farther east. Fruit persistent after the leaves have fallen. July.

6. LONÍCERA L. Sp. Pl. 173. 1753.

Erect or climbing shrubs, with opposite mostly entire leaves; flowers spicate, capitate or geminate, usually somewhat irregular. Calyx-tube ovoid or nearly globular, the limb slightly 5-toothed. Corolla tubular, funnelform, or campanulate, often gibbous at the base, the limb 5-lobed, more or less oblique, or 2-lipped. Stamens 5, inserted on the tube of the corolla; anthers linear or oblong. Ovary 2–3-celled; ovules numerous in each cavity, pendulous; style slender; stigma capitate. Berry fleshy, 2–3-celled or rarely 1-celled, few-seeded. Seeds ovoid or oblong with fleshy endosperm and a terete embryo. [Named for Adam Lonitzer, 1528–1586, a German botanist.]

About 100 species, natives of the north temperate zone, a few in tropical regions. Besides the following, some 8 others occur in the western parts of North America.

* Climbing or trailing vines; flowers in heads, or interrupted spikes; upper leaves connate-perfoliate.

Corolla 2-lipped, the upper lip 4-lobed, the lower entire.
- Corolla glabrous within. — 1. *L. Caprifolium.*
- Corolla pubescent within.
  - Leaves pubescent, at least beneath; corolla yellow.
    - Leaves pubescent on both sides, at least when young, ciliate; corolla slightly gibbous at base. — 2. *L. hirsuta.*
    - Leaves glabrous above, pubescent beneath; corolla-tube strongly gibbous at the base. — 3. *L. glaucescens.*
  - Leaves glabrous on both sides, very glaucous beneath.
    - Corolla greenish yellow, the tube somewhat gibbous.
      - Corolla-tube 3″–5″ long; filaments hirsute at the base. — 4. *L. dioica.*
      - Corolla-tube 5″–7″ long; filaments nearly glabrous. — 5. *L. Sullivantii.*
    - Corolla bright yellow or orange, its slender tube not gibbous. — 6. *L. flava.*

Corolla tubular, the short limb nearly equally 5-lobed. — 7. *L. sempervirens.*

* * Climbing vines; flowers in pairs on short axillary peduncles. — 8. *L. Japonica.*

* * * Shrubs; flowers in pairs on axillary bracted peduncles.

Bracts of the peduncle subulate, linear, minute, or none.
- Leaves rarely cordate, more or less pubescent, or ciliate.
  - Leaves pale, or glaucous, thick, strongly reticulate-veined.
    - Peduncles shorter than the flowers; fruit blue; leaves ciliate. — 9. *L. coerulea.*
    - Peduncles equalling the flowers; fruit red; leaves not ciliate. — 10. *L. oblongifolia.*
  - Leaves bright green, thin, ciliate, not strongly reticulate; fruit red. — 11. *L. ciliata.*
  - Leaves pale, densely pubescent beneath, even when old. — 12. *L. Xylosteum.*
- Leaves cordate, glabrous. — 13. *L. Tatarica.*

Bracts of the peduncle broad, foliaceous. — 14. *L. involucrata.*

1. Lonicera Caprifòlium L. Italian, or Perfoliate Honeysuckle. (Fig. 3455.)

L. Caprifolium L. Sp. Pl. 173. 1753.
Lonicera grata Ait. Hort. Kew. 1: 231. 1789.
Caprifolium gratum Pursh. Fl. Am. Sept. 161. 1814.

Climbing high, glabrous and somewhat glaucous. Upper one to three pairs of leaves connate-perfoliate, glaucous beneath, the others sessile or short-petioled, oval or obovate, all rounded at the base, entire; flowers in terminal capitate sessile clusters; corolla glabrous within, 1′–1½′ long, purple without, the limb white within, strongly 2-lipped; upper lip 4-lobed, the lower one narrow, reflexed; tube slightly curved, not gibbous; stamens and style much exserted; berries red.

Thickets, southern New York, New Jersey and Pennsylvania to Michigan and in the southern States. Escaped from cultivation and naturalized. Native of Europe. Called also American, or Fragrant Woodbine. May-June.

2. Lonicera hirsùta Eaton. Hairy Honeysuckle. (Fig. 3456.)

L. hirsuta Eaton, Man. Ed. 2, 307. 1818.

Twining, the branches hirsute-pubescent. Upper one or two pairs of leaves connate-perfoliate, the others oval or ovate, short-petioled or sessile, softly pubescent beneath, dark green and appressed-pubescent above, ciliate, obtuse or obtusish at the apex, rounded or narrowed at the base, 2′–3½′ long; flowers verticillate in short terminal interrupted spikes; corolla pubescent within, about 1′ long, viscid-pubescent without, orange-yellow, the tube slender, somewhat gibbous at the base, the limb strongly 2-lipped, about as long as the tube; stamens and style exserted, filaments hirsute below.

In woodlands, Vermont and Ontario to Manitoba, Pennsylvania, Ohio and Michigan. Called also Rough Woodbine. June–July.

3. Lonicera glaucéscens Rydb. Douglas' Honeysuckle. (Fig. 3457.)

Lonicera Douglasii Hook. Fl. Bor. Am. 1: 282. 1833. Not *Caprifolium Douglasii* Lind. 1830.
Lonicera glaucescens Rydb. Bull. Torr. Club, 24: 90. 1897.

Similar to the preceding species, the branches glabrous. Leaves glabrous above, pubescent, at least on the veins, beneath, 1½′–2′ long, chartaceous-margined, not ciliate, usually only the upper pair connate-perfoliate; flowers verticillate in a short terminal interrupted spike; corolla yellow, changing to reddish, pubescent or puberulent without, pubescent within, 1′ long, or less, the tube rather strongly gibbous at the base, the 2-lipped limb shorter than the tube; stamens nearly glabrous, or somewhat pubescent; style hirsute; both exserted.

Ontario to Saskatchewan, Pennsylvania, Ohio and Nebraska. May–June.

4. Lonicera diòica L. Smooth-leaved or Glaucous Honeysuckle. (Fig. 3458.)

Lonicera dioica L. Syst. Ed. 12, 165. 1767.
L. glauca Hill, Hort. Kew. 446. *pl. 18.* 1769.
L. parviflora Lam. Encycl. 1: 728. 1783.

Glabrous throughout, twining or shrubby, 3°–10° long. Leaves very glaucous beneath, 1½′–3′ long, the upper connate-perfoliate, oval, obtuse, the lower sessile or short-petioled, narrower; flowers several in a terminal cluster, yellowish green and tinged with purple, glabrous without, pubescent within, the tube 3″–4″ long, gibbous at the base, scarcely longer than the 2-lipped limb; stamens hirsute below, exserted with the style; berries red, 3″–4″ in diameter.

In rocky and usually dry situations, Quebec to Manitoba, south, especially along the mountains to North Carolina, and to Ohio and Michigan. Ascends to 3500 ft. in North Carolina. All the leaves of young shoots are sometimes connate-perfoliate. Small Yellow Honeysuckle. May–June.

5. Lonicera Sullivántii A. Gray. Sullivant's Honeysuckle. (Fig. 3459.)

Lonicera Sullivantii A. Gray, Proc. Amer. Acad. 19: 76. 1883.

Similar to the preceding species, very glaucous. Leaves oval or obovate, glaucous and commonly pubescent beneath, obtuse; flowers larger than those of the preceding species, the tube 5″–7″ long, slightly exceeding the limb, pale yellow; stamens usually nearly glabrous; fruit yellow, 3″ in diameter.

In woodlands, Tennessee, Ohio and western Ontario (?) to Wisconsin and Manitoba. May–June.

6. Lonicera flàva Sims. Yellow Honeysuckle. (Fig. 3460.)

Lonicera flava Sims, Bot. Mag. *pl. 1318.* 1810.

Twining to a height of several feet, or trailing, glabrous. Leaves broadly oval, or elliptic, entire, obtuse at the apex, narrowed or rounded at the base, short-petioled, or the upper sessile, green above, glaucous beneath, the pairs subtending flowers connate-perfoliate; flowers bright orange-yellow, fragrant, in a terminal interrupted spike; corolla 1′–1½′ long, the slender tube pubescent above within, not gibbous at the base, the limb strongly 2-lipped, about half as long as the tube; filaments and style glabrous, exserted; fruit about 3″ in diameter.

North Carolina to Kentucky, Georgia and Alabama. April–May.

7. Lonicera sempérvirens L. Trumpet or Coral Honeysuckle. (Fig. 3461.)

Lonicera sempervirens L. Sp. Pl. 173. 1753.

Glabrous, high climbing, evergreen in the South. Leaves oval, obtuse, 2′–3′ long, or the lower ones smaller, narrower and acutish, the upper pairs connate-perfoliolate, all conspicuously glaucous and sometimes slightly pubescent beneath, dark green above; flowers verticillate in terminal interrupted spikes; corolla scarlet or yellow, 1′–1½′ long, glabrous, the tube narrow, slightly expanded above, the limb short and nearly regular; stamens and style scarcely exserted; berries scarlet, about 3″ in diameter.

In low grounds, or on hillsides, Connecticut to Florida, west to Nebraska and Texas. April–Sept.

8. Lonicera Japónica Thunb. Japanese or Chinese Honeysuckle. (Fig. 3462.)

Lonicera Japonica Thunb. Fl. Jap. 89. 1784.

Pubescent, climbing high or trailing. Leaves all short-petioled, ovate, entire, 1′–3′ long, acute at the apex, rounded at the base, dark green and glabrous above, pale and usually sparingly pubescent beneath; flowers in pairs from the upper axils, peduncled, leafy-bracted at the base, white or pink, fading to yellow, pubescent without, the tube nearly 1′ long, longer than the strongly 2-lipped limb; stamens and style exserted; berries black, 3″–4″ in diameter.

Freely escaped from cultivation, southern New York and Pennsylvania to North Carolina and West Virginia. Naturalized from eastern Asia. June–Aug.

9. Lonicera coerùlea L. Blue or Mountain Fly-Honeysuckle. (Fig. 3463.)

Lonicera coerulea L. Sp. Pl. 174. 1753.

Erect, shrubby, 1°–3° high, the twigs sometimes slightly pubescent. Leaves oval or obovate, 1′–1½′ long, very obtuse at the apex, rounded or narrowed at the base, thick, conspicuously reticulate-veined, pale and more or less pubescent beneath, glabrous above, at least when mature, ciliate on the margins; flowers in pairs in the axils, short-peduncled, subulate-bracted, yellow, 6″–8″ long, corolla pubescent, or glabrate, the tube gibbous at the base, the limb nearly regular, its lobes oblong, equalling or slightly exceeding the tube; ovaries of the two flowers becoming united and forming an oblong or nearly globose, bluish-black 2-eyed berry, about 2½″ in diameter.

In low grounds, Newfoundland to Alaska, south to Rhode Island, Pennsylvania, Wisconsin and California. Also in Europe and Asia. June.

10. Lonicera oblongifòlia (Goldie) Hook. Swamp Fly-Honeysuckle. (Fig. 3464.)

Xylosteum oblongifolium Goldie, Edinb. Phil. Journ. 6: 323. 1822.

Lonicera oblongifolia Hook. Fl. Bor. Am. 1: 284. *pl. 100.* 1833.

Similar to the preceding species. Leaves oval-oblong, 1′–2′ long, reticulate-veined, glabrous or nearly so on both sides when mature, downy-pubescent when young, not ciliate; flowers in pairs on long slender peduncles; corolla yellow, or purplish within, 8″–9″ long, gibbous at the base, deeply 2-lipped; bracts at the summit of the peduncle minute or none; ovaries remaining distinct, or becoming more or less united, the berries red or crimson.

In swamps, Quebec to Manitoba, south to Vermont, New York, Pennsylvania and Michigan. May–June.

11. Lonicera ciliàta Muhl. American Fly Honeysuckle. (Fig. 3465.)

Vaccinium album L. Sp. Pl. 350. 1753. Not *L. alba* L.
Lonicera ciliata Muhl. Cat. 23. 1813.

Shrubby, 3°–5° high, the twigs glabrous. Petioles 2″–3″ long, very slender; leaves thin, bright green on both sides, ovate or sometimes oval, acute or acutish at the apex, rounded or cordate at the base, villous-pubescent beneath when young, glabrous or nearly so when mature, but the margins strongly ciliate; flowers in pairs from the axils, about 8″ long; peduncles long-filiform; bracts very small, subulate; corolla-limb nearly regular, its lobes short; berries separate, ovoid, light red, about 3″ in diameter.

In moist woods, Nova Scotia and New Brunswick to Manitoba, south to Connecticut, Pennsylvania and Michigan. Ascends to 2000 ft. in the Catskills. May.

12. Lonicera Xylósteum L. Fly Honeysuckle. (Fig. 3466.)

Lonicera Xylosteum L. Sp. Pl. 174. 1753.

A shrub, 3°–7° high, the foliage densely appressed-pubescent when young. Leaves ovate, oval, or obovate, entire, short-petioled, rather pale green, obtuse, or the upper acute at the apex, obtuse, subcordate or narrowed at the base, glabrous above when mature, persistently pubescent beneath, 1′–3′ long; petioles 2″–4″ long; peduncles axillary, 2-flowered, 4″–8″ long, about as long as the flowers, or longer; flowers yellowish white; bracts linear-subulate; berries scarlet.

Escaped from cultivation in New York. Native of Europe and Asia. May–June.

13. Lonicera Tatárica L. Tartarian Bush-Honeysuckle. (Fig. 3467.)

Lonicera Tatarica L. Sp. Pl. 173. 1753.

A glabrous shrub, 5°–10° high. Leaves ovate, rather thin, not conspicuously reticulate-veined, 1′–3′ long, acute or obtusish at the apex, cordate at the base, not ciliate; flowers in pairs on slender axillary peduncles; corolla pink to white, 7″–8″ long, the tube gibbous at the base, the limb irregularly and deeply 5-lobed, somewhat 2-lipped; peduncles 1′ long; bracts linear, sometimes as long as the corolla-tube; stamens and style scarcely exserted; berries separate, red.

Escaped from cultivation, Ontario and Vermont to southern New York, New Jersey and Kentucky. May. Native of Asia.

14. Lonicera involucràta (Richards.) Banks. Involucred Fly-Honeysuckle. (Fig. 3468.)

Xylosteum involucratum Richards. App. Frank. Journ. Ed. 2, 6. 1823.
Lonicera involucrata Banks; Richards. *loc. cit.* 1823.

A glabrate or pubescent shrub, 3°–10° high. Leaves short-petioled, ovate, oval, or obovate, 2′–6′ long, acute or acuminate at the apex, narrowed or rounded at the base, more or less pubescent, at least when young; peduncles axillary, 1′–2′ long, 2–3-flowered; bracts foliaceous, ovate or oval, often cordate; bractlets also large, at length surrounding the fruit; flowers yellow; corolla pubescent, funnelform, the limb nearly equally 5-lobed; lobes short, little spreading; stamens and style slightly exserted; berries separate, globose, or oval, nearly black, about 4″ in diameter.

In woodlands, Quebec to western Ontario and Michigan, west to British Columbia and Alaska, south to Arizona, Utah and California. June–July.

7. DIERVÍLLA Moench, Meth. 492. 1794.

Shrubs, with opposite leaves, and yellow axillary and terminal cymose or solitary flowers. Calyx-tube slender, elongated, narrowed below, the limb with 5 linear persistent lobes. Corolla narrowly funnelform, the tube slightly gibbous at the base, the limb nearly regular, 5-lobed. Stamens 5, inserted on the corolla; anthers linear. Ovary 2-celled; ovules numerous in each cavity; style filiform; stigma capitate. Fruit a linear-oblong capsule, narrowed or beaked at the summit, septicidally 2-valved, many-seeded. Seed coat minutely reticulated; endosperm fleshy; embryo minute. [Named for Dr. Dierville, who brought the plant to Tournefort.]

Two species, the following and one in the mountains of the southern States. The Japanese and Chinese *Weigelas*, often referred to this genus, are here regarded as distinct.

1. Diervilla Diervílla (L.) MacM. Bush Honeysuckle. (Fig. 3469.)

Lonicera Diervilla L. Sp. Pl. 175. 1753.
Diervilla trifida Moench, Meth. 492. 1794.
D. Diervilla MacM., Bull. Torr. Club, 19: 15. 1892.

A shrub, 2°–4° high, glabrous or nearly so throughout, with terete branches. Leaves short-petioled, ovate or oval, acuminate at the apex, usually rounded at the base, 2′–5′ long, irregularly crenulate and often slightly ciliate on the margins; peduncles terminal, or in the upper axils, slender, 1–5-flowered; flowers about 9″ long; corolla more or less pubescent both without and within, regular or slightly irregular, 3 of its lobes somewhat united; capsule glabrous, linear-oblong, slender, beaked, crowned with the persistent calyx-lobes.

In dry or rocky woodlands, Newfoundland to the Northwest Territory, south to North Carolina and Michigan. Called also Gravel-weed. May–June.

Family 36. **ADOXÀCEAE** Fritsch; Engl. & Prantl, Nat. Pfl. Fam. 4: Abt. 4, 170. 1891.

Moschatel Family.

Glabrous slender herbs, with scaly or tuberiferous rootstocks, basal and opposite ternately compound leaves, and small green flowers in terminal capitate clusters. Calyx-tube hemispheric, adnate to the ovary, its limb 2–3-toothed. Corolla rotate, regular, 4–6-lobed. Stamens twice as many as the lobes of the corolla, inserted in pairs on its tube; filaments short; anthers peltate, 1-celled. Ovary 3–5-celled; style 3–5-parted; ovules 1 in each cavity, pendulous. Fruit a small drupe with 3–5-nutlets. Endosperm cartilaginous.

The family contains only the following monotypic genus of the north temperate zone.

1. ADÓXA L. Sp. Pl. 367. 1753.

Characters of the family. [Greek, without glory, *i. e.*, insignificant.]

1. Adoxa Moschatéllina L. Musk-root. Hollow-root. Moschatel. (Fig. 3470.)

Adoxa Moschatellina L. Sp. Pl. 367. 1753.

Stems simple, weak, erect, 3′–6′ high, bearing a pair of opposite ternate leaves usually above the middle. Basal leaves 1–4, long-petioled, ternately compound, the segments broadly ovate or orbicular, obtuse, thin, 3-cleft or 3-parted, the lobes obtuse and mucronulate; head 3″–4″ in diameter, composed of 3–6 flowers; corolla of the terminal flower 4–5 lobed, those of the others usually 5–6-lobed, drupe green, bearing the persistent calyx-lobes above the middle.

In shaded rocky places, Arctic America, south to Iowa and Wisconsin and in the Rocky Mountains to Colorado. Also in northern Europe and Asia. Other English names are Bulbous Fumitory, Glory-less, Musk Crowfoot or Wood Crowfoot. Odor musky. May.

Family 37. VALERIANÀCEAE Batsch, Tabl. Aff. 227. 1802.

VALERIAN FAMILY.

Herbs with opposite leaves, no stipules, and usually small perfect or polygamo-dioecious flowers, in corymbed panicled or capitate cymes. Calyx-tube adnate to the ovary, its limb inconspicuous or none in flower, often becoming prominent in fruit. Corolla gamopetalous, epigynous, somewhat irregular, its tube narrowed, and sometimes gibbous or spurred at the base, its limb spreading, mostly 5-lobed. Stamens 1–4, inserted on the corolla and alternate with its lobes, usually exserted. Ovary inferior, 1–3-celled, one of the cavities containing a single anatropous ovule, the others empty. Fruit indehiscent, dry, containing a single suspended seed. Endosperm little or none; embryo straight; cotyledons oblong.

About 9 genera and 275 species of wide distribution, most abundant in the northern hemisphere.

Fruit 1-celled; persistent calyx-lobes becoming awn-like; tall herbs.	1. *Valeriana.*
Fruit 3-celled; calyx-lobes minute or none; low herbs.	2. *Valerianella.*

1. VALERIÀNA L. Sp. Pl. 31. 1753.

Perennial strong-smelling mostly tall herbs, the leaves mainly basal and the cymose flowers paniculate in our species. Calyx-limb of 5–15 bristle-like plumose teeth, short and inrolled in flower, but elongated, rolled outward and conspicuous in fruit. Corolla funnelform or tubular, usually more or less gibbous at the base, the limb nearly equally 5-lobed. Stamens commonly 3. Style entire, or minutely 2–3-lobed at the summit. Fruit compressed, 1-celled, 1-nerved on the back, 3-nerved on the front. [Name Middle Latin, from *valere*, to be strong.]

About 175 species, mostly in the temperate and colder parts of the north temperate zone and the Andes of South America. Besides the following, 5 others occur in southern and western North America.

Corolla-tube very slender, 6″–10″ long; basal leaves cordate.	1. *V. pauciflora.*
Corolla-tube 1″–3″ long; basal leaves not cordate.	
Leaves thick, parallel-veined, entire, or the segments not dentate.	2. *V. edulis.*
Leaves thin, reticulate-veined, the segments dentate.	
Lower leaves spatulate, often entire; plant glabrous.	3. *V. sitchensis.*
All the leaves pinnately divided; plant pubescent, especially at the nodes.	4. *V. officinalis.*

1. Valeriana pauciflòra Michx. Large-flowered Valerian. (Fig. 3471.)

V. pauciflora Michx. Fl. Bor. Am. 1: 18. 1803.

Rootstocks slender, usually horizontal. Stem glabrous, erect or ascending, 1°–3° high, often sending out runners from the base; leaves thin, the basal ones slender-petioled, simple, or sometimes with a pair of small leaflets on the petiole, broadly ovate, cordate, acute at the apex, the margins crenate or dentate; stem leaves pinnately 3–7-divided, the terminal segment larger than the others; cymes terminal, clustered; flowers few or numerous; corolla pink, its tube very slender, 6″–10″ long; bracts linear; fruit oblong or oblong-lanceolate, about 3″ long, glabrous or puberulent; bristles of the calyx at length elongated and plumose.

In moist soil, Pennsylvania to West Virginia, Illinois, Kentucky and Missouri. Called also American Wild Valerian. May–June.

2. Valeriana édulis Nutt. Edible Valerian. Tobacco-root. (Fig. 3472.)

V. edulis Nutt. in T. & G. Fl. N. A. 2: 48. 1841.

Erect, 1°–4° high, from a deep fusiform carrot-shaped root. Stem glabrous, or nearly so, the young leaves commonly more or less pubescent and the older ones finely ciliate, sometimes glabrous; basal leaves spatulate or oblanceolate, thick, 3′–12′ long, 2″–10″ wide, obtuse at the apex, narrowed into a margined petiole, parallel-veined, entire or with a few obtuse entire lobes; stem leaves few, sessile, pinnately-parted into linear or lanceolate segments; flowers yellowish-white, small (2″) polygamo-dioecious, paniculate, the inflorescence at length widely branching; bracts lanceolate, short; fruit narrowly ovate, glabrous or nearly so, 2″ long, at length exceeded by the plumose calyx-teeth.

In wet open places, Ontario to British Columbia, south to Ohio, Wisconsin, and in the Rocky Mountains to Arizona and New Mexico. Called also Oregon Tobacco; the root cooked for food. May–Aug.

3. Valeriana sylvática Banks. Wood or Swamp Valerian. (Fig. 3473.)

Valeriana sylvatica Banks; Richards. App. Frank. Journ. Ed. 2, 2. 1823.

Valeriana dioica Pursh, Fl. Am. Sept. 727. 1814. Not L. 1753.

Erect, glabrous or very nearly so throughout, 8′–2½° high. Rootstocks creeping or ascending; basal leaves thin, petioled, oblong or spatulate, obtuse, entire, or with a few obtuse lobes, reticulate-veined, 2′–10′ long, 3″–18″ wide; stem leaves 2–4 pairs, petioled, pinnately parted into 3–13 ovate to lanceolate, dentate or rarely entire, acute or obtuse segments; inflorescence cymose-paniculate, at length loosely branched; flowers pink or nearly white, 3″–4″ long; bracts linear-lanceolate; fruit ovate, glabrous, 1½″ long.

In wet soil, Newfoundland to British Columbia, south to Vermont, New York, Ontario, Michigan and in the Rocky Mountains to New Mexico and Arizona. Also in northeastern Asia. Called also American Wild Valerian. May–Aug.

4. Valeriana officinàlis L. Garden or Great Wild Valerian. Vandal-root. (Fig. 3474.)

Valeriana officinalis L. Sp. Pl. 31. 1753.

Erect, 2°–5° high, more or less pubescent, especially at the nodes. Leaves all pinnately parted into 7–25 thin reticulate-veined lanceolate acute or acuminate segments, sharply dentate, or those of the upper leaves entire, usually with some scattered hairs beneath; flowers pink or nearly white, about 2″ long; inflorescence of several rather compact corymbed cymes; bracts linear-lanceolate, rather large; fruit glabrous, ovate, about 1½″ long.

Escaped from gardens to roadsides in New York and New Jersey. Native of Europe and Asia. Old names Cats' Valerian, Setwell, Cut-heal, All-heal. June–Aug.

2. VALERIANÉLLA Poll. Hist. Pl. Palat. 1: 29. 1776.

Annual dichotomously branched herbs, the basal leaves tufted, entire, those of the stem sessile, often dentate, the flowers in terminal, compact or capitate, in our species corymbed or panicled cymes. Corolla small, white, blue, or pink, nearly regular. Calyx-limb short or obsolete in flower, in fruit various, not divided into filiform plumose segments, often none. Corolla-tube narrowed at the base, the limb spreading, 5-lobed. Stamens 3; style minutely 3-lobed at the summit. Fruit 3-celled, 2 of the cells empty, and in our species about as large as the fertile one. [Name a diminutive of Valerian.]

About 50 species, natives of the northern hemisphere, most abundant in the Mediterranean region. Besides the following, 8 others occur in the western parts of North America.

Corolla funnelform, the short tube not longer than the limb or about equalling it.
- Fruit flattened, twice as broad as thick. — 1. *V. Locusta.*
- Fruit triangular-pyramidal. — 2. *V. chenopodifolia.*
- Fruit oblong-tetragonal or ovoid-tetragonal, grooved.
  - Groove of the fruit broad and shallow. — 3. *V. radiata.*
  - Groove of the fruit narrow. — 4. *V. stenocarpa.*
- Fruit globose or saucer-shaped. — 5. *V. Woodsiana.*

Corolla salverform, the slender tube much longer than the limb. — 6. *V. longiflora.*

1. Valerianella Locústa (L.) Bettke. European Corn Salad. (Fig. 3475.)

Valeriana Locusta and var. *olitoria* L. Sp. Pl. 33. 1753.
Valerianella olitoria Poll. Hist. Pl. Palat. 1: 30. 1776.
Valerianella Locusta Bettke. Anim. Val. 10. 1826.

Glabrous, or pubescent at the nodes, 6′–12′ high, usually branched from the base and repeatedly forked. Basal leaves spatulate or oblanceolate, rounded and obtuse at the apex, 1¼′–2′ long, 3″–5″ wide, entire; upper stem leaves oblong-lanceolate, usually dentate; peduncles short; cymes 3″–6″ broad, almost capitate; bracts linear or linear-oblong; corolla blue, about 1″ long; fruit flattened, rounded on the edges, 1″ long, glabrous, twice as broad as thick, depressed-orbicular in outline, the two empty cavities smaller than the fertile one, which has a corky mass at its back.

In waste places, New York, New Jersey, and Pennsylvania to Virginia and Louisiana. Naturalized from Europe. The leaves are cultivated and used for salad under the name of Fetticus. Called also White Pot-Herb, Lamb's Lettuce, Milk Grass. April–July.

2. Valerianella chenopodifòlia (Pursh) DC. Goose-foot Corn Salad. (Fig. 3476.)

Fedia chenopodifolia Pursh, Fl. Am. Sept. 727. 1814.
Valerianella chenopodifolia DC. Prodr. 4: 629. 1830.
Fedia Fagopyrum T. & G. Fl. N. A. 2: 51. 1841.

Glabrous, 1°–2° high. Leaves entire, or the basal and lower ones repand, spatulate, obtuse; upper stem leaves oblong or lanceolate, 1′–3′ long; cymes dense, 6″–8″ broad, at length slender-peduncled; bracts lanceolate or oblong-lanceolate; corolla white, about 1″ long; fruit triangular-pyramidal, 2″ long, 1″ thick, glabrous or minutely pubescent, the two empty cavities narrower than the fertile one but about as deep.

In moist soil, western New York to Virginia, west to Wisconsin and Kentucky. May–July.

3. Valerianella radiàta (L.) Dufr. Beaked Corn Salad. (Fig. 3477.)

Valeriana Locusta var. *radiata* L. Sp. Pl. 34. 1753.
Fedia radiata Michx. Fl. Bor. Am. 1: 118. 1803.
Valerianella radiata Dufr. Hist. Val. 57. 1811.

Glabrous, or minutely pubescent below, 6′–18′ high. Basal and lower leaves spatulate, obtuse, entire, the upper lanceolate, usually dentate; cymes 4″–6″ broad, dense; bracts small, lanceolate or oblong-lanceolate; corolla white, 1″ long; fruit narrowly ovate-tetragonal, finely pubescent or sometimes glabrous, 1″ long, ½″ thick, the empty cavities as thick as or thicker than the beaked fertile one and separated from each other by a broad shallow groove.

In moist soil, New York to Florida, west to Michigan, Missouri and Texas. Called also Lamb's Lettuce. May–July.

4. Valerianella stenocàrpa (Engelm.) Krok. Narrow-celled Corn Salad. (Fig. 3478.)

Fedia stenocarpa Engelm. Bost. Journ. Nat. Hist. 6: 216. 1857.
Valerianella stenocarpa Krok, Kongl. Svensk. Akad. Handl. 5: 64. 1866.

Similar to the preceding species and perhaps better regarded as a variety of it. Fruit oblong-tetragonal, slightly smaller, glabrous or sometimes pubescent; sterile cavities not as thick as the oblong seed-bearing one, and separated from each other by a narrow groove.

Kansas and Missouri to Texas. March–June.

5. Valerianella Woodsiàna (T. & G.) Walp. Woods' Corn Salad. (Fig. 3479.)

Fedia Woodsiana T. & G. Fl. N. A. 2: 52. 1841.
Valerianella Woodsiana Walp. Rep. 2: 527. 1843.

Usually larger than any of the preceding species, sometimes 3° high, glabrous or very nearly so throughout. Basal and lower leaves spatulate, obtuse, entire; upper leaves lanceolate or linear-oblong, usually dentate; cymes 3″–6″ broad, few-flowered; bracts comparatively large, lanceolate; corolla white, about 1″ long; fruit glabrous, nearly globular, about 1″ in diameter, the empty cavities inflated, introrse with a depression or concavity between them, as broad as the fertile one.

In moist soil, New York, Pennsylvania and Ohio to Tennessee and Texas. May–July.

Valerianella Woodsiàna umbilicàta (Sulliv.) A. Gray, Proc. Am. Acad. 19: 82. 1883.
F. umbilicata Sulliv. Am. Journ. Sci. 42: 50. 1842.

Empty cells of the fruit bladdery-inflated, curved together at the ends, forming a deep concavity. Same range.

Valerianella Woodsiàna patellària (Sulliv.) A. Gray, Proc. Am. Acad. 19: 82. 1883.
Fedia patellaria Sulliv.; A. Gray, Man. 183. 1848.

Empty cells divergent, the fruit becoming saucer-shaped. Ohio and Pennsylvania. This variety and the preceding one are probably but forms of the species.

6. Valerianella longiflòra (T. & G.) Walp. Long-flowered Corn Salad. (Fig. 3480.)

Fedia longiflora T. & G. Fl. N. A. 2: 51. 1841.
Valerianella longiflora Walp. Rep. 2: 527. 1843

Glabrous; stem usually several times forked, 6′–12′ high. Leaves very obtuse, the basal ones spatulate, 1′–2½′ long, 4″–8″ wide, those of the stem oblong or spatulate-oblong, smaller, somewhat clasping; cymes dense, corymbed, commonly numerous, several–many-flowered; corolla salverform, pink or purplish, about 6″ long, the almost filiform tube 3–4 times as long as the somewhat irregular 5-parted limb, the lobes linear-oblong; bracts with small gland-tipped teeth; fruit broadly ovate or nearly orbicular in outline, the empty cavities divergent, larger than the oblong seed-bearing one.

In moist rocky situations, Missouri and Arkansas. April–May.

Family 38. DIPSACÀCEAE Lindl. Veg. Kingd. 699. 1847.

TEASEL FAMILY.

Perennial biennial or annual herbs, with opposite or rarely verticillate leaves, and perfect gamopetalous flowers in dense involucrate heads. Stipules none. Flowers borne on an elongated or globose receptacle, bracted and involucellate. Calyx-tube adnate to the ovary, its limb cup-shaped, disk-shaped, or divided into spreading bristles. Corolla epigynous, the tube usually enlarged at the throat, the limb 2–5-lobed. Stamens 2–4, inserted on the tube of the corolla and alternate with its lobes; filaments distinct; anthers versatile, longitudinally dehiscent. Ovary inferior, 1-celled, style filiform; stigma undivided, terminal, or oblique and lateral; ovule 1, anatropous. Fruit an achene, its apex crowned with the persistent calyx-lobes. Seed-coat membranous; endosperm fleshy; embryo straight.

About 7 genera and 140 species, natives of the Old World.

Scales of the elongated receptacle prickly pointed. 1. *Dipsacus.*
Scales of the receptacle not prickly, herbaceous, capillary, or none. 2. *Scabiosa.*

1. DÍPSACUS L. Sp. Pl. 97. 1753.

Rough-hairy or prickly tall erect biennial or perennial herbs, with opposite dentate entire or pinnatifid, usually large leaves, and blue or lilac flowers in dense terminal peduncled

oblong heads in our species. Bracts of the involucre and scales of the receptacle rigid or spiny pointed. Involucels 4–8-ribbed with a somewhat spreading border. Limb of the calyx cup-shaped, 4-toothed or 4-lobed. Corolla oblique or 2-lipped, 4-lobed. Stamens 4. Stigma oblique or lateral. Achene free from or adnate to the involucel. [Greek, to thirst, the leaves of some species holding water.]

About 15 species, natives of the Old World.

Scales of the receptacle straight-pointed. 1. *D. sylvestris.*
Scales of the receptacle hooked at the apex. 2. *D. fullonum.*

1. Dipsacus sylvéstris Huds. Wild, Common or Card Teasel. (Fig. 3481.)

Dipsacus fullonum L. Sp. Pl. 97. In part. 1753.
Dipsacus sylvestris Huds. Fl. Angl. 49. 1762.

Biennial, stout, with numerous short prickles on the stem, branches, peduncles, midribs of the leaves and involucre, otherwise glabrous or nearly so, 3°–6° high. Leaves sessile, or the upper ones connate-perfoliate, lanceolate or oblong, the upper acuminate and generally entire, the lower obtuse or obtusish, crenate or sometimes pinnatifid at the base, often 1° long; heads at first ovoid, becoming cylindric, at length 3′–4′ long; flowers lilac, 4″–6″ long; leaves of the involucre linear, curved upward, as long as the head or longer; scales of the receptacle ovate, tipped with a long straight subulate barbed awn, usually exceeding the flowers.

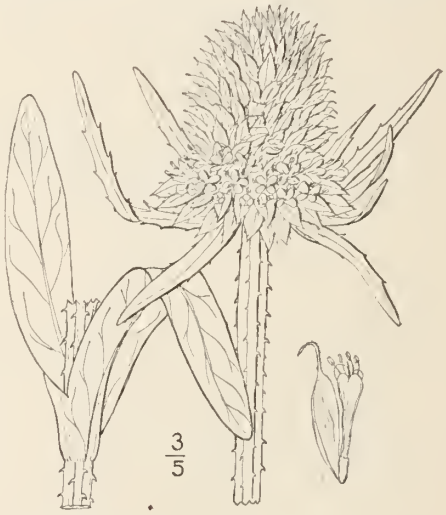
In waste places, Maine and Ontario to Virginia, west to Michigan. Naturalized from Europe and native also of Asia. July–Sept. Other English names are Venus' Bath, Venus' Cup, Wood- or Church-brooms, Shepherds' Staff, Card or Water Thistle, Gipsy Combs, Hutton-weed.

2. Dipsacus fullònum L. Fuller's Teasel. Fuller's Thistle. (Fig. 3482.)

Dipsacus fullonum L. Sp. Pl. 97. 1753.
Dipsacus fullonum var. *sativus* L. Sp. Pl. Ed. 2, 1677. 1763.

Similar to the preceding species. Leaves of the involucre, or some of them, shorter than the heads, spreading or at length reflexed; scales of the receptacle with hooked tips, about equalling the flowers, which are usually paler than in *D. sylvestris*.

About wool mills, Eastern and Middle States, rare. Fugitive from Europe. Other English names are Clothiers' Brush, Venus' Bath, or Cup, Drapers' Teasel. Generally regarded as probably a cultivated variety of the preceding species, as it is not found wild, except as an evident escape.



2. SCABIÒSA L. Sp. Pl. 98. 1753.

Herbs, with opposite leaves, no prickles, and blue pink or white flowers in peduncled involucrate heads. Bracts of the involucre herbaceous, separate, or slightly united at the base. Scales of the receptacle small, capillary, or none, not sharp-pointed nor hooked. Involucels 2–8-ribbed, the margins 4-toothed or expanded. Calyx-limb 5-toothed. Limb of the corolla 4–5-cleft, oblique or 2-lipped. Stamens 4 (rarely 2). Stigma oblique or lateral. Achene more or less adnate to the involucel, crowned with the persistent calyx. [Latin, scale, from its repute as a remedy for scaly eruptions.]

About 100 species, natives of the Old World.

Leaves, or some of them, pinnatifid; receptacle hairy, not scaly. 1. *S. arvensis.*
Leaves entire, or toothed; receptacle scaly. 2. *S. australis.*

1. Scabiosa arvénsis L. Field Scabious. (Fig. 3483.)

Scabiosa arvensis L. Sp. Pl. 99. 1753.
Knautia arvensis Coult. Dips. 29. 1823.

Perennial, pubescent, simple or little branched, 1°–3° high. Basal and lower leaves petioled, lanceolate, acute or acuminate, entire, lobed, or pinnatifid, 3′–8′ long; upper leaves sessile, often deeply pinnatifid; heads long-peduncled, depressed-globose, 1′–1½′ broad; flowers lilac-purple, about 6″ long; receptacle depressed-hemispheric, not scaly, covered with hairs between the flowers; achene angled, crowned with the 8 or 10 linear-subulate calyx-teeth.

In cultivated fields and waste places, Massachusetts, Vermont, New York and Pennsylvania. Adventive from Europe. Other English names are Blue Buttons, Blue Caps, Gipsy or Egyptian Rose, Pincushion. June–Sept.

2. Scabiosa austràlis Wulf. Southern Scabious. (Fig. 3484.)

Scabiosa australis Wulf. in Roem. Arch. 3: Part 3, 316. 1803.
Succisa australis Reicheneb. Fl. Germ. Excurs. 196. 1830.

Perennial, puberulent, at least above; stem slender, branched, 1½°–3° high. Basal leaves oblanceolate to oblong, mostly obtuse, 4′–12′ long, the petiole often as long as the blade, or onger; stem leaves distant, lanceolate or oblong-lanceolate, entire, or toothed, short-petioled, or the upper sessile, acute or acuminate; heads of purple flowers long-peduncled, rather less than 1′ in diameter, oblong-ovoid in fruit; receptacle scaly, the scales about as long as the involucels or longer; achene crowned with 5 calyx-teeth.

Naturalized from Europe in central New York and Massachusetts. Pincushion-flower. Summer.

Family 39. CUCURBITÀCEAE B. Juss. Hort. Trian. 1759.

GOURD FAMILY.

Climbing or trailing, herbaceous vines, usually with tendrils. Leaves alternate, petioled, generally palmately lobed or dissected. Flowers solitary or racemose, monoecious or dioecious. Calyx-tube adnate to the ovary, its limb campanulate or tubular, usually 5-lobed, the lobes imbricated. Petals usually 5, inserted on the limb of the calyx, separate, or united into a gamopetalous corolla. Stamens mostly 3 (sometimes 1), 2 of them with 2-celled anthers, the other with a 1-celled anther; filaments short, often somewhat monadelphous. Ovary 1–3-celled; style terminal, simple, or lobed; ovules few or numerous, anatropous. Fruit a pepo, indehiscent, or rarely dehiscent at the summit, or bursting irregularly; or sometimes dry and membranous. Seeds usually flat; endosperm none.

About 90 genera and 650 species, mainly natives of tropical regions, a few in the temperate zones.

Flowers large, yellow; prostrate vine.	1. *Cucurbita.*
Flowers small, white or greenish; climbing vines.	
Fruit glabrous; seeds numerous, horizontal.	2. *Melothria.*
Fruit prickly; seeds 1 or few, erect or pendulous.	
Fruit dehiscent at the apex or bursting irregularly; several-seeded.	
Leaves 3–7-lobed; anthers 3.	3. *Micrampelis.*
Leaves digitately compound; anther 1.	4. *Cyclanthera.*
Fruit indehiscent, 1-seeded.	5. *Sicyos.*

1. CUCÚRBITA L. Sp. Pl. 1010. 1753.

Rough prostrate vines, rooting at the nodes, with branched tendrils, usually lobed leaves mostly cordate at the base, and large yellow axillary monoecious flowers. Calyx-tube campanulate, usually 5-lobed. Corolla campanulate, 5-lobed to about the middle, the lobes recurving. Staminate flowers with three stamens, the anthers linear, more or less united and no pistil. Pistillate flowers with 1 pistil; ovary oblong with 3–5 many-ovuled placentae; style short, thick; stigmas 3–5, each 2-lobed, papillose; staminodia 3. Fruit large, fleshy, with a thick rind, many-seeded, indehiscent. [The Latin name of the gourd.]

About 10 species, natives of America, Asia and Africa. Besides the following, some 6 others occur in the southern and southwestern United States.

1. Cucurbita foetidíssima H.B.K. Missouri Gourd. Calabazilla. Wild Pumpkin. (Fig. 3485.)

Cucurbita foetidissima H.B.K. Nov. Gen. 2: 123. 1817.
Cucumis perennis James in Long's Exp. 2: 20. 1823.
Cucurbita perennis A. Gray, Bost. Journ. Nat. Hist. 6: 193. 1850.

Stem stout, rough, hirsute, trailing to a length of 15°–25°. Root large, carrot-shaped. Petioles stout, 3′–8′ long, very rough; leaves ovate-triangular, thick and somewhat fleshy, cordate or truncate at the base, acute at the apex, 4′–12′ long, usually slightly 3–5-lobed, denticulate, rough above, canescent beneath; peduncles 1′–2′ long; flowers mostly solitary; corolla 2½′–4′ long; pepo globose or globose-ovoid, 2′–3′ in diameter, smooth, its pulp fibrous and bitter.

Dry soil, Nebraska to Texas and Mexico, west to southern California. May–Sept.

Cucurbita Pèpo L., the Pumpkin, is found occasionally in waste places.

Citrullus Citrúllus (L.) Karst., the Watermelon, is found escaped from cultivation along river-shores in Virginia and West Virginia.

2. MELÒTHRIA L. Sp. Pl. 35. 1753.

Slender, mostly climbing vines, with simple or rarely bifid tendrils, lobed or entire thin leaves, and small white or yellow monoecious flowers, the staminate clustered, the pistillate often solitary. Calyx campanulate, 5-toothed. Corolla campanulate, deeply 5-parted. Stamens 3 in the staminate flowers, the anthers distinct or slightly united, the pistil wanting or rudimentary. Fertile flowers with 1 pistil; ovary ovoid, constricted below the corolla; placentae 3; ovules numerous; style short; stigmas 3, linear. Fruit small, berry-like, pulpy, many-seeded. [From the Greek for some vine, probably *Bryonia Cretica*.]

About 64 species, natives of warm and tropical regions, most abundant in the Old World. Only the following occurs in the United States.

1. Melothria péndula L. Creeping Cucumber. (Fig. 3486.)

Melothria pendula L. Sp. Pl. 35. 1753.

Root perennial. Stem slender, climbing to a height of 3°–5°, branched, glabrous, grooved; petioles ½′–2½′ long; leaves nearly orbicular in outline, finely pubescent or scabrous on both sides, cordate at the base, 5-lobed or 5-angled, denticulate or dentate; tendrils puberulent; staminate flowers 4–7, racemose, borne on a peduncle ½′–1′ long; fertile flowers solitary, slender-peduncled; corolla greenish white, about 2″ broad; fruit smooth, ovoid, green, 4″–6″ long.

In thickets, Pennsylvania (Schweinitz, according to Cogniaux); Virginia to Florida, west to Indiana, Kentucky, Louisiana and northern Mexico. June–Sept.

3. MICRÁMPELIS Raf. Med. Rep. (II.) 5: 350. 1808.

[ECHINOCYSTIS T. & G. Fl. N. A. 1: 542. 1840.]

Mostly annual climbing herbs, with branched tendrils, lobed or angled leaves, and small white monoecious flowers. Calyx-tube campanulate, 5-6-lobed. Corolla very deeply 5-6-parted. Stamens 3 in the staminate flowers, the anthers more or less coherent. Pistillate flowers with a 2-celled ovary; ovules 2 in each cavity; style very short; stigma hemispheric or lobed. Fruit fleshy or dry at maturity, densely spiny, 1-2-celled, usually with 2 seeds in each cavity, dehiscent at the summit. Testa of the seed roughened. [Greek, small-vine.]

About 25 species, natives of America. Besides the following, about 10 others occur in the western United States.

1. Micrampelis lobàta (Michx.) Greene. Wild Balsam Apple. Mock Apple. (Fig. 3487.)

Momordica echinata Muhl. Trans. Am. Phil. Soc. 3: 180. Name only. 1793.
Sicyos lobata Michx. Fl. Bor. Am. 2: 217. 1803.
Echinocystis lobata T. & G. Fl. N. A. 1: 542. 1840.
Micrampelis lobata Greene, Pittonia, 2: 128. 1890.

Stem nearly glabrous, angular and grooved, branching, climbing to a height of 15°–25°, sometimes villous-pubescent at the nodes. Petioles 1′–3′ long; leaves thin, roughish on both sides, deeply cordate at the base, 3–7-lobed to about the middle, the lobes triangular-lanceolate, acute or acuminate, the margins remotely serrulate; staminate flowers very numerous in narrow compound racemes; pistillate flowers solitary, or rarely 2 together; fruit ovoid, green, about 2′ long, armed with slender spines.

Along rivers, and in waste places, Maine to Minnesota and Ontario, south to Virginia (according to Cogniaux), Pennsylvania, Kentucky, Kansas and Texas. Eastward, mostly occurring as an introduced plant. July-Sept.

4. CYCLANTHÈRA Schrad. Ind. Sem. Hort. Goett. 1831.

Climbing, annual or perennial, mostly glabrous vines, with forked or simple tendrils, usually digitately compound leaves and small white or greenish monoecious flowers. Calyx cup-shaped, 5-toothed. Corolla rotate, deeply 5-parted. Staminate flowers racemose or paniced, the stamens united into a central column; anther 1, annular in our species. Pistillate flowers solitary; ovary obliquely ovoid, beaked, 1–3-celled, with 2 ovules in each cavity; style short; stigma large, hemispheric. Fruit spiny, obliquely ovoid, beaked, at length irregularly dehiscent, few-seeded. [Greek, circle-anther.]

About 40 species, natives of America.

1. Cyclanthera dissécta (T. & G.) Arn. Cut-leaved Cyclanthera. (Fig. 3488.)

Discanthera dissecta T. & G. Fl. N. A. 1: 697. 1840.
Cyclanthera dissecta Arn. in Hook. Journ. Bot. 3: 280. 1841.

Annual; stem grooved and angular, glabrous, branching, climbing to a height of 3°–4°, or straggling. Petioles 1′–2′ long; leaves digitately 3–7-foliolate, the leaflets oval or oblong, usually acute at each end, ½′–2′ long, rough on both sides, dentate, or somewhat lobed; staminate flowers racemose, borne on a peduncle ½′–2′ long; pistillate flowers solitary, very short-peduncled; fruit narrowed at the base, slightly oblique, about 1′ long, armed with slender spines.

Thickets, Kansas to Texas, Louisiana and northern Mexico. July-Sept.

5. SÍCYOS L. Sp. Pl. 1013. 1753.

Annual climbing vines, with branched tendrils, angled or lobed leaves, and small white or green monoecious flowers. Calyx-tube campanulate or cup-shaped, 5-toothed. Corolla campanulate or rotate, 5-parted nearly to the base. Staminate flowers corymbose or racemose, with 3 stamens, the filaments united into a short column, the anthers coherent; pistil wanting. Pistillate flowers several together in capitate long-peduncled clusters, with no stamens; ovary oblong or fusiform, 1-celled; ovule 1, pendulous; style short, slender; stigmas usually 3. Fruit spiny, indehiscent, 1-seeded. [Greek, a cucumber or gourd.]

About 35 species, natives of America and Australasia. Besides the following, 2 others occur in the southwestern states.

1. Sicyos angulàtus L. One-seeded Bur-Cucumber. Star Cucumber. (Fig. 3489.)

Sicyos angulatus L. Sp. Pl. 1013. 1753.

Stem angled, more or less viscid-pubescent, climbing to a height of 15°–25°, or trailing. Petioles stout, 1′–4′ long, pubescent; leaves nearly orbicular, rough on both sides, rather thin, deeply cordate at the base, 5-angled or 5-lobed, the lobes acute or acuminate, the margins denticulate; staminate flowers loosely corymbose or racemose, borne on elongated peduncles; fertile flowers capitate, their peduncles shorter; fruits sessile, 3–10 together, yellowish, about ½′ long, pubescent, armed with slender rough spines.

Along river banks and in moist places, Quebec and Ontario to Florida, west to Minnesota, Kansas and Texas. Naturalized in eastern Europe. Called also Nimble Kate. Leaves sometimes 10′ across. June–Sept.

Family 40. CAMPANULÀCEAE Juss. Gen. 163. 1789.

BELL-FLOWER FAMILY.

Herbs (some tropical species shrubs or even trees), with alternate exstipulate entire dentate or rarely lobed leaves, acrid and usually milky juice, and racemose spicate paniculate or solitary perfect flowers. Calyx-tube adnate to the ovary, its limb mostly 5-lobed or 5-parted, the lobes equal or slightly unequal, valvate or imbricate in the bud, commonly persistent. Corolla gamopetalous, regular or irregular, inserted at the line where the calyx becomes free from the ovary, its tube entire, or deeply cleft on one side, its limb 5-lobed, regular, or more or less 2-lipped, or corolla rarely divided into separate petals. Stamens 5, alternate with the corolla-lobes, inserted with the corolla; filaments separate or connate; anthers 2-celled, introrse, separate, or united into a ring or tube. Ovary 2–5-celled (rarely 6–10-celled), with the placentae projecting from the axis, or 1-celled with two parietal placentae; style simple; stigma mostly 2–5-lobed, pilose by a tuft or ring of hairs, or glabrous; ovules anatropous. Fruit a capsule or berry. Seeds very numerous and small; embryo minute, straight; endosperm fleshy.

About 60 genera and 1500 species, of wide geographic distribution.

Corolla regular, campanulate or rotate; anthers separate.
- Corolla campanulate, rarely rotate; flowers all complete. 1. *Campanula.*
- Corolla rotate; earlier flowers cleistogamous. 2. *Legouzia.*

Corolla irregular; anthers connate around the style. 3. *Lobelia.*

1. CAMPÁNULA L. Sp. Pl. 163. 1753.

Perennial or annual herbs, with alternate or basal leaves. Flowers large or small, solitary, racemose, paniculate, or glomerate, regular, complete, blue, violet, or white. Calyx-tube hemispheric, turbinate, obovoid, or prismatic, adnate to the ovary, the limb deeply 5-lobed or 5-parted (rarely 3–4-parted). Corolla campanulate or rotate, 5-lobed or 5-parted. Stamens 5, free from the corolla; filaments usually dilated at the base; anthers separate. Ovary inferior, 3–5-celled; stigma 3–5-lobed. Capsule wholly or partly inferior, crowned by the persistent calyx-lobes, opening on the sides, either near the top, middle or bottom by 3–5 small valves or perforations, or tending to be indehiscent in some species. [Diminutive of the Latin *campana*, a bell.]

About 250 species, natives of the northern hemisphere. Besides the following, some 8 others occur in the southern and western parts of North America; all known as Bell-flower.

* Corolla campanulate; flowers solitary, racemose, glomerate, or panicled.

Flower solitary at the end of the stem; arctic and alpine plants.
Corolla 4″–6″ long; capsule-openings near the summit. 1. *C. uniflora.*
Corolla 6″–12″ long; capsule-openings near the base. 2. *C. rotundifolia.*
Flowers racemose, glomerate, or paniculate.
Corolla 7″–15″ long.
Stem leaves linear, the basal orbicular, mostly cordate. 2. *C. rotundifolia.*
Leaves all ovate to lanceolate; plants pubescent or scabrous.
Flowers pedicelled in 1-sided racemes. 3. *C. rapunculoides.*
Flowers sessile in terminal and axillary clusters. 4. *C. glomerata.*
Corolla 2″–5″ long.
Plant rough; style not exserted. 5. *C. aparinoides.*
Plant smooth, glabrous, slightly viscid; style long-exserted. 6. *C. divaricata.*

* * Corolla rotate; flowers spicate. 7. *C. Americana.*

1. Campanula uniflòra L. Arctic Harebell or Bellflower. (Fig. 3490.)

Campanula uniflora L. Sp. Pl. 163. 1753.

Perennial, glabrous or nearly so; stem simple, 1-flowered, 1′–6′ high. Leaves linear or lineal-oblong, acute, sessile, thickish, entire or sparingly deutate, 9″–18″ long, or the lower aud basal oues spatulate, obtuse and narrowed into petioles; flower erect; calyx-tube turbinate, glabrous or pubescent, shorter than or equalling the lobes; corolla campanulate, 4″–6″ long, blue; capsule cylindric or club-shaped, about 6″ loug, erect, opeuing by valves near the summit.

Labrador and Arctic America to Alaska, south in the Rocky Mountains to Colorado. Also in northern Europe and Asia. Summer.

2. Campanula rotundifòlia L. Harebell. Blue Bells of Scotland. (Fig. 3491.)

Campanula rotundifolia L. Sp. Pl. 163. 1753.

Perennial by sleuder rootstocks, glabrous or ncarly so; stems erect or diffuse, often several from the same root, simple or brauched, 6′–3° high. Basal leaves nearly orbicular or broadly ovate, usually cordate, slender-petioled, ¼′–1′ wide, dentate or entire, often wauting at flowering time; stem leaves linear or linear-oblong, acute, mostly entire, sessile, or the lower narrowed into short petioles and somewhat spatulate; flowers several or numerous, racemose (rarely solitary), drooping or spreading, slender-pedicelled; calyx-lobes subulate, spreading, longer than the short-turbinate tube; corolla blue, campanulate, 7″–12″ long; capsule obconic or ovoid, pendulous, ribbed, opening by short clefts near the base.

On moist rocks and in meadows, Labrador to Alaska, south to New Jersey, Pennsylvania, Illinois, Nebraska, in the Rocky Mountains to Arizona and in the Sierra Nevada to California. Also in Europe and Asia. Other English names are Thimbles, Lady's Thimble, Heath or Witches' Bells, Round-leaved Bellflower. June–Sept.

Campanula rotundifòlia Langsdorfiàna (A. DC.) Britton, Mem. Torr. Club, 5: 309. 1894.

C. linifolia var. *Langsdorfiana* A. DC. Prodr. 7: 471. 1839.
C. rotundifolia var. *alpina* Tuckerm. Amer. Journ. Sci. 45: 27. 1843.
Flower commonly solitary, erect, nearly or quite 1′ long; calyx-lobes nearly filiform, spreading or deflexed. Summits of the White Mountains of New Hampshire; Quebec to Labrador and Arctic America.

Campanula rotundifòlia velùtina DC. Fl. France, 6: 432. 1815.

Stem and leaves pubescent or eauescent. Sand hills, Burt Lake, Michigan (according to Gray).

3. Campanula rapunculoides L. Creeping or European Bellflower. (Fig. 3492.)

Campanula rapunculoides L. Sp. Pl. 165. 1753.

Perennial by slender rootstocks; stem glabrous or pubescent, simple or rarely branched, leafy, erect, rather stout, 1°–3° high. Leaves pubescent or puberulent, crenate-denticulate, ovate or ovate-lanceolate, acute or acuminate, the lower and basal ones mostly cordate, 3′–6′ long, 1′–2′ wide, slender-petioled, the upper short-petioled or sessile, smaller; flowers short-pedicelled, drooping, 1′–1½′ long in an elongated bracted 1-sided raceme; corolla campanulate, blue to violet, rather deeply 5-lobed, much longer than the linear spreading calyx-lobes; capsule globose, nodding, about 4″ in diameter; opening near the base.

In fields and along roadsides, New Brunswick to Ontario, southern New York, Pennsylvania and Ohio. Naturalized from Europe. July–Sept.

4. Campanula glomeràta L. Clustered Bellflower. Dane's Blood. (Fig. 3493.)

Campanula glomerata L. Sp. Pl. 166. 1753.

Perennial by short rootstocks; stem stout, simple, erect, pubescent, leafy, 1°–2° high. Leaves pubescent on both sides, crenulate, the lower and basal ones oblong or ovate, mostly obtuse, sometimes cordate, slender-petioled, 2′–4′ long, the upper lanceolate or ovate-lanceolate, acute, sessile or clasping, smaller; flowers about 1′ long, sessile, erect and spreading in terminal and axillary glomerules; corolla campanulate, blue, rather deeply 5-lobed; calyx-lobes lanceolate, acuminate; capsule ovoid or oblong, erect, about 3″ high, opening near the base.

In fields and along roadsides, eastern Massachusetts. Naturalized from Europe. Sometimes called Canterbury Bells, a name more properly belonging to *C. medium* and *C. Trachelium*. June–Aug.

5. Campanula aparinoides Pursh. Marsh or Bedstraw Bellflower. (Fig. 3494.)

Campanula aparinoides Pursh Fl. Am. Sept. 159. 1814.

Perennial; stems very slender or filiform, weak, reclining or diffuse, rough with short retrorse bristles, similar to those of *Galium asprellum*, leafy, paniculately branched, 6′–2° long. Leaves lanceolate, or linear-lanceolate, sessile, sparingly dentate with low teeth, or entire, rough on the margins and midrib, acute at both ends, ½′–1½′ long, 1″–3″ wide; flowers pale blue or white, paniculate, 2½″–4″ long; pedicels filiform; buds drooping; corolla open-campanulate, deeply 5-cleft, its tube equalling or longer than the triangular-lanceolate acute calyx-lobes; style included; capsule subglobose, opening near the base.

In grassy swamps, New Brunswick to the Northwest Territory, south to Georgia, Kentucky, Nebraska and Colorado. Called also Slender Bellflower. June–Aug.

6. Campanula divaricàta Michx. Panicled Bellflower. (Fig. 3495.)

Campanula divaricata Michx. Fl. Bor. Am. 1: 109. 1803.
Campanula flexuosa Michx. loc. cit. 1803?

Perennial, glabrous but somewhat viscid; stem erect, paniculately branched, slender, 1°–3° high. Leaves lanceolate, ovate or oblong-lanceolate, the uppermost sometimes linear, sharply serrate, acuminate at the apex, narrowed to the base, the upper sessile, the lower petioled, 2′–3′ long, 3″–12″ wide, or the lowest commonly shorter and broader; flowers very numerous in compound panicles, drooping, slender-pedicelled; corolla light blue, campanulate, about 3″ long; calyx-lobes lanceolate, acute, scarcely spreading, often dentate; style long-exserted; capsule turbinate, about 2½″ long, opening near the middle.

On rocky banks, mountains of Virginia and West Virginia to Georgia and Tennessee. Ascends to 2500 ft. in North Carolina. June–Sept.

7. Campanula Americàna L. Tall Bellflower. (Fig. 3496.)

Campanula Americana L. Sp. Pl. 164. 1753.

Annual or biennial, more or less pubescent; stem erect or nearly so, rather slender, simple or rarely with a few long branches, 2°–6° high. Leaves thin, ovate, oblong, or lanceolate, serrate, acuminate at the apex, narrowed at the base, petioled, or the upper sessile, 3′–6′ long, the lowest sometimes cordate; flowers in a loose or dense terminal sometimes leafy spike, which is often 1°–2° long; lower bracts foliaceous, the upper subulate; corolla rotate, blue, or nearly white, about 1′ broad, deeply 5-cleft; calyx-lobes linear-subulate, spreading, style declined and curved upward, long-exserted; capsule narrowly turbinate, ribbed, erect, 4″–5″ long, opening near the summit.

In moist thickets and woods, New Brunswick to Ontario and Minnesota, south to Florida, Kentucky and Arkansas. Rare near the coast in the Middle States and New England. Ascends to 3000 ft. in West Virginia. July–Sept.

2. LEGOÙZIA Durand, Fl. Bourg. 2: 26. 1782.

[SPECULARIA Heist.; A. DC. Mon. Camp. 344. 1830.]

Annual herbs, with alternate toothed or entire leaves, the stem and branches long, slender. Flowers axillary, sessile or nearly so, 2-bracted, or the upper panicled in some exotic species, the earlier (lower) ones small, cleistogamous, the later with a blue or purple nearly rotate corolla. Calyx-tube narrow, the lobes in the earlier flowers 3 or 4, in the later 4 or 5. Corolla 5-lobed or 5-parted, the lobes imbricated in the bud. Filaments flat; anthers separate, linear. Ovary 3-celled (rarely 2- or 4-celled); ovules numerous; stigma usually 3-lobed. Capsule prismatic, cylindric, or narrowly obconic, opening by lateral valves. Seeds ovoid, oblong, or lenticular.? [Name unexplained.]

About 10 species, natives of the northern hemisphere, one extending into South America.

Capsule narrowly oblong.
- Leaves sessile; capsule-valves near the top. — 1. *L. biflora.*
- Leaves cordate-clasping; capsule-valves at about the middle. — 2. *L. perfoliata.*

Capsule linear-cylindric; leaves sessile; western. — 3. *L. leptocarpa.*

1. Legouzia biflòra (R. & P.) Britton. Small Venus' Looking-glass. (Fig. 3497.)

Campanula biflora R. & P. Fl. Per. 2: 55. *pl. 200, f. 6.* 1799.
Specularia biflora A. Gray, Proc. Am. Acad. 11: 82. 1876.
Legouzia biflora Britton, Mem. Torr. Club, 5: 309. 1894.

Glabrous, or nearly so; stem simple or branched, very slender, roughish on the angles, 6′–2° high. Leaves ovate, oblong, or the upper lanceolate, sessile, acute or obtuse at the apex, crenate with a few teeth, or entire, 4″–10″ long, or the upper smaller; earlier flowers with 3 or 4 ovate to lanceolate calyx-lobes, those of the later flowers 4 or 5, lanceolate-subulate, longer; capsule obloug-cylindric, 3″–5″ long, opening by valves close under the calyx-teeth.

In dry soil, Virginia to Tennessee, Kansas, Florida and Texas. Also in California and South America. April-July.

2. Legouzia perfoliàta (L.) Britton. Venus' Looking-glass. (Fig. 3498.)

Campanula perfoliata L. Sp. Pl. 169. 1753.
Specularia perfoliata A. DC. Mon. Campan. 351. 1830.
L. perfoliata Britton, Mem. Torr. Club, 5: 309. 1894.

More or less pubescent; stem deusely leafy, simple or branched from near the base, slender, rather weak, sometimes prostrate, retrorse-hispid on the angles, or nearly smooth, 6′–24′ loug. Leaves orbicular or broadly ovate, strongly cordate-clasping or the lower merely sessile, crenate-dentate or sometimes entire, ¼′–1′ wide; flowers solitary or 2–3 together in the axils, sessile, the later (upper) ones with 5 (rarely 4) triangular-lanceolate acumiuate rigid calyx-lobes, aud a rotate blue or violet corolla 5″–10″ broad, the earlier ones with 3–4 shorter calyx-lobes longer than the rudimentary corolla; capsule oblong, or narrowly turbinate, 2″–3″ long, finally opening at about the middle; seeds lenticular.

In dry woods, Maine and Ontario to British Columbia, south to Florida, Louisiana, Mexico, Utah and Oregon. Called also Clasping Bellflower. May-Sept.

3. Legouzia leptocàrpa (Nutt.) Britton. Western Venus' Looking-glass. (Fig. 3499.)

Campylocera leptocarpa Nutt. Trans. Am. Phil. Soc. (II) 8: 257. 1843.
Specularia leptocarpa A. Gray, Proc. Am. Acad. 11: 82. 1876.
L. leptocarpa Britton, Mem. Torr. Club, 5: 309. 1894.

Hirsute, or nearly glabrous; stem slender, simple, or branched from the base, 6′–15′ high. Leaves linear-lanceolate to oblong, sessile, not clasping, acute at both ends, or the lowest obtuse at the apex, entire or sparingly denticulate, ½′–1′ long, 1″–2″ wide; flowers sessile and usually solitary in the axils, the later ones with 4–5 subulate calyx-lobes and a rotate corolla 5″–9″ broad, the earlier ones with 3 shorter calyx-lobes and rudimentary corolla; capsule linear-cylindric, 4″–8″ long, less than 1″ thick; the upper at length opening near the summit; seeds oblong.

In dry soil, western Missouri and Kansas to Montana and Texas. May-Aug.

3. LOBÈLIA L. Sp. Pl. 929. 1753.

Herbs (some tropical species shrubs), with alternate or basal leaves, and racemose spicate or paniculate, often leafy bracted, red yellow blue or white flowers. Calyx-tube turbinate, hemispheric or ovoid, adnate to the ovary. Corolla-tube straight, oblique, or incurved, divided to the base on one side, 2-lipped in our species, the lobe on each side of the cleft erect or recurved, turned away from the other three which are somewhat united, the sinuses inclining to extend to the base of the corolla at maturity so as to divide it into 5 petals. Stamens free from the corolla-tube, monadelphous, at least above, two or all the 5 anthers with a tuft of hairs at the tips, three of them usually larger than the other two, all united into a tube or ring around the style. Ovary 2-celled, the 2 placentae many-ovuled; stigma 2-lobed or 2-cleft. Capsule loculicidally 2-valved. [Named after Matthias de L'Obel, 1538–1616, a Flemish botanist.]

About 225 species of wide geographic distribution. Besides the following, some 12 others occur in the southern and western United States.

* Aquatic; stems simple, nearly naked; flowers light blue.

Leaves terete, hollow, obtuse, all tufted at the base. 1. *L. Dortmanna.*
Leaves flat, linear-oblong or spatulate, entire or glandular-denticulate. 2. *L. paludosa.*

* * Terrestrial plants of wet or dry soil; stems leafy.

1. Corolla-tube 5″–12″ long.

Flowers bright scarlet (rarely white); corolla-tube 10″–12″ long. 3. *L. cardinalis.*
Flowers blue, white, or blue and white; corolla-tube 5″–7″ long.
Leaves ovate, lanceolate, or the lower ones obovate.
Leaves glabrous or sparingly pubescent.
Calyx-lobes hirsute; sinuses with large deflexed auricles. 4. *L. syphilitica.*
Calyx-lobes glabrous or glandular, usually without auricles. 5. *L. amoena.*
Leaves densely puberulent; calyx hirsute; auricles small. 6. *L. puberula.*
Leaves elongated-linear, strongly glandular-denticulate. 7. *L. glanduosa.*

2. Corolla-tube only 2″–4″ long.

Stems mostly simple: flowers in terminal spike-like racemes.
Sinuses of the calyx without auricles. 8. *L. spicata.*
Sinuses of the calyx with reflexed subulate auricles. 9. *L. leptostachys.*
Stems mostly paniculately branched; flowers in loose racemes.
Stem stout, pubescent; leaves ovate or oblong, dentate. 10. *L. inflata.*
Stems slender, glabrous; stem-leaves narrow, the basal wider.
Pedicels mostly longer than flowers, 2-bracteolate near the middle. 11. *L. Kalmii.*
Pedicels not longer than flowers, not bracteolate, or only so at the base.
Corolla 2½″–3½″ long; calyx-tube hemispheric in fruit. 12. *L. Nuttallii.*
Corolla 4½″–5½″ long; calyx-tube turbinate. 13. *L. Canbyi.*

1. Lobelia Dortmánna L. Water Lobelia. Water Gladiole. (Fig. 3500.)

Lobelia Dortmanna L. Sp. Pl. 929. 1753.

Perennial, aquatic, glabrous throughout, somewhat fleshy; roots numerous, white, fibrous; stem slender, simple, erect, hollow, minutely scaly, 6′–18′ high. Leaves all submersed and tufted at the base of the stem, terete, hollow, obtuse, longitudinally divided by a partition, 1′–2′ long, about 2″ thick; flowers in a loose terminal raceme, blue, 6″–8″ long; pedicels filiform, shorter than or equalling the flowers; calyx-lobes subulate or lanceolate, the sinuses usually not at all appendaged; corolla-tube 3″–4″ long, its lower lip glabrous or nearly so.

Borders of ponds, usually in sandy soil, sometimes wholly emersed when the water is low, New Jersey and Pennsylvania to Nova Scotia, New Brunswick and the Northwest Territory. Also in Europe. July–Sept.

2. Lobelia paludòsa Nutt. Swamp Lobelia. (Fig. 3501.)

Lobelia paludosa Nutt. Gen. 2: 75. 1818.

Perennial, aquatic, glabrous throughout; roots few and thick; stem nearly naked, slender, simple, or branched above, 1°–4° high. Leaves flat, narrowly oblong or spatulate, emersed, obtuse or acutish, entire or repand-denticulate and glandular, those of the stem few, small and sessile, the basal ones 2′–9′ long, 2″–4″ wide, narrowed into petioles; flowers pale blue, racemose, 5″–6″ long; calyx-lobes narrowly lanceolate, the sinuses commonly not at all appendaged; corolla-tube 3″–4″ long, its lower lip pubescent at the base.

In swamps and ponds, Delaware to Florida and Louisiana, mostly near the coast. May–July.

3. Lobelia cardinàlis L. Cardinal-flower. Red Lobelia. (Fig. 3502.)

Lobelia cardinalis L. Sp. Pl. 930. 1753.

Perennial by offsets; stem slightly pubescent, or glabrous, leafy, simple or rarely branched, 2°–4½° high. Leaves oblong, oval, ovate-lanceolate, or lanceolate, thin, glabrous or sparingly pubescent, 2′–6′ long, ¼′–1½′ wide, acuminate or acute at both ends, crenulate or denticulate, the upper sessile, the lower petioled; flowers racemose, commonly numerous, bright scarlet or red (rarely white), 1′–1½′ long; bracts usually glandular; calyx glabrous or pubescent, its lobes linear, elongated, acute; corolla-tube nearly or quite 1′ long; larger anthers glabrous.

In moist soil, New Brunswick to Florida, west to the Northwest Territory, Kansas and Texas. July–Sept.

4. Lobelia syphilítica L. Great Lobelia. Blue Cardinal-flower. (Fig. 3503.)

Lobelia syphilitica L. Sp. Pl. 931. 1753.

Perennial by short offsets; stem sparingly pubescent, rather stout, very leafy, usually simple, 1°–3° high. Leaves thin, green, glabrous or sparingly puberulent, 2′–6′ long, ½′–2′ wide, oval, oblong, or lanceolate, acute or acuminate at the apex, narrowed at the base, repand-denticulate, or irregularly crenate-dentate, sessile, or the lower obovate, obtuse and narrowed into petioles; flowers bright blue, or occasionally white, 10″–12″ long, densely racemose, leafy-bracted; calyx-lobes lanceolate, acuminate, pubescent or ciliate, the sinuses appendaged by large deflexed auricles; corolla-tube 5″–6″ long, about 2″ thick, the lobes of its larger lip oblong-oval, obtuse, glabrous; larger anthers glabrous.

In moist soil, Maine and Ontario to Minnesota and Dakota, south to Georgia, Louisiana and Kansas. Said to hybridize with the preceding species. July–Oct.

Lobelia syphilitica Ludoviciàna A. DC. Prodr. 7: 377. 1839.

Glabrous or very nearly so; leaves thick, pale green, oblong or lanceolate, nearly entire, the lower obtuse and spatulate; calyx-lobes sparingly pubescent; lobes of the larger lip of the corolla acutish. Nebraska to Louisiana.

5. Lobelia amoèna Michx. Southern Lobelia. (Fig. 3504.)

Lobelia amoena Michx. Fl. Bor. Am. 2: 152. 1803.

Nearly glabrous throughout, perennial; stem simple, slender, leafy, 1°–4° high. Leaves thin, oblong-lanceolate, narrowly oblong, or oval, repand-dentate or denticulate, the lower petioled and mostly obtuse, 2′–6′ long, the upper sessile, acute or acutish, smaller; flowers blue, racemose, nearly 1′ long; bracts narrow and small, or the lower foliaceous, glandular; pedicels 1″–2½″ long; calyx-lobes linear-subulate, acuminate, glabrous, elongated, the sinuses usually not auricled; corolla-tube 5″–7″ long, 1½″–2″ thick; larger anthers glabrous, or puberulent at the tip; lobes of the larger lip of the corolla broadly ovate to oval, obtuse, glabrous.

In swamps, North Carolina to Florida; probably within our area, though not reported. July–Sept.

Lobelia amoèna glandulífera A. Gray, Syn. Fl. 2: Part 1, 4. 1878.

Smaller, stem very slender; leaves 1′–2′ long, mostly obtuse, glandular-dentate; bracts small, very glandular; raceme somewhat secund; sinuses of the calyx sometimes slightly auricled, the lobes commonly glandular. Southern Delaware and Virginia to Florida and Alabama.

6. Lobelia pubérula Michx. Downy Lobelia. (Fig. 3505.)

Lobelia puberula Michx. Fl. Bor. Am. 2: 152. 1803.

Perennial, densely and finely puberulent all over, slightly viscid; stem simple, or rarely with a few branches, stout or slender, leafy, 1°–3° high. Leaves oval, oblong, ovate, or obovate, rather thick, the lower petioled, all obtuse or the uppermost acute, denticulate or crenate-dentate, the teeth often glandular; flowers blue, 8″–10″ long, in long spike-like racemes; lower bracts, or sometimes all of them, foliaceous, glandular; pedicels very short; calyx hirsute or pubescent, its lobes narrowly lanceolate, elongated, usually with small short rounded auricles at the sinuses; corolla-tube about 5″ long, 1″–1½″ thick, the lobes of its larger lip broadly ovate, glabrous; larger anthers minutely bearded.

In moist sandy soil, southern New Jersey to Florida, west to Illinois, Kansas and Texas. Ascends to 3500 ft. in North Carolina. Aug.–Oct.

7. Lobelia glandulòsa Walt. Glandular Lobelia. (Fig. 3506.)

Lobelia glandulosa Walt. Fl. Car. 218. 1788.

Perennial; stem slender, leafy below, nearly naked above, simple, glabrous, or sparingly pubescent, 1°–4° high. Leaves elongated-linear to narrowly lanceolate, thick, glabrous, strongly glandular-dentate, the lower petioled, obtuse, often 7′ long and 4″ wide, the upper sessile, acutish, shorter; flowers racemose-spicate, secund, often few and distant, blue, nearly 1′ long; bracts narrow, glandular; peduncles very short, sometimes with a pair of glands near the base; calyx-tube often densely hirsute, its lobes subulate, the sinuses not appendaged; corolla-tube 5″–6″ long, 1″–1½″ thick, about twice as long as the calyx-lobes; larger lip of the corolla pubescent within at the base, its lobes ovate, acutish; anthers all bearded at the tip.

In swamps near the coast, southern Virginia to Florida. July–Sept.

8. Lobelia spicàta Lam. Pale Spiked Lobelia. (Fig. 3507.)

Lobelia spicata Lam. Encycl. 3: 587. 1789.

Perennial or biennial, puberulent; stem strict, simple, leafy, 1°–4° high. Leaves thickish, pale green, repand-dentate, crenulate, or entire, the basal ones commonly tufted, broadly oblong, oval, or obovate, very obtuse, narrowed into short petioles, 1′–3½′ long; 1′–2′ wide; stem leaves sessile, oblong, lanceolate, or spatulate, obtuse, the uppermost gradually smaller and acutish; flowers pale blue, 4″–5″ long, densely or distantly racemose-spicate, the inflorescence sometimes 2° long; bracts linear, entire; pedicels very short, ascending; calyx-tube turbinate, usually glabrous, shorter than its subulate spreading lobes, the sinuses usually not at all appendaged; corolla-tube about 2½″ long and 1″ thick.

In dry, mostly sandy soil, or in meadows, Ontario to the Northwest Territory, south to North Carolina, Louisiana and Arkansas. Ascends to 2500 ft. in Virginia. June–Aug.

Lobelia spicàta hirtélla A. Gray, Syn. Fl. 2: Part 1, 6. 1878.

Rough or roughish; bracts and calyx-lobes hirsute or ciliate. Manitoba to the Northwest Territory, south to Michigan and Kansas.

Lobelia spicàta parviflòra A. Gray, Syn. Fl. 2: Part 1, 6. 1878.

Glabrous or nearly so; stem low, very slender; flowers only about 3″ long; calyx-lobes broadly subulate. In a swamp at Lancaster, Pa.

9. Lobelia leptóstachys A. DC. Spiked Lobelia. (Fig. 3508.)

Lobelia leptostachys A. DC. Prodr. 7: 376. 1839.

Similar to the preceding species; stem usually stouter, puberulent or glabrous, 2°–4° high. Basal leaves oval or obovate, obtuse; stem leaves spatulate, oblong, or lanceolate, obtuse, sometimes slightly scabrous, denticulate or entire, or the uppermost narrower and acute; spike-like raceme elongated, usually dense; bracts linear, glabrous; pedicels very short; calyx-lobes linear-subulate, nearly as long as the corolla-tube, the sinuses with subulate deflexed auricles; flowers blue, 4″–5″ long.

In dry soil, Virginia to Ohio and Illinois, Georgia and Kansas. June–Aug.

10. Lobelia inflàta L. Indian Tobacco. Wild Tobacco. (Fig. 3509.)

Lobelia inflata L. Sp. Pl. 931. 1753.

Annual, pubescent or hirsute, very acrid; stem leafy, commonly paniculately branched, 1°–3° high. Leaves thin, repand-dentate or denticulate, the lower oval or obovate, obtuse, 1′–2½′ long, narrowed into short petioles, the upper sessile, oval, oblong, ovate, or ovate-lanceolate, obtuse, or the uppermost acute; flowers light blue, 2″–3″ long, usually distant in somewhat spike-like racemes; lower bracts foliaceous, the upper subulate; pedicels 2″–5″ long in fruit; calyx glabrous or nearly so, its subulate lobes about as long as the corolla; capsule inflated, 3″–4″ long, finely transversely veined between the ribs.

In fields and thickets, usually in dry soil, Labrador to the Northwest Territory, Georgia, Nebraska and Arkansas. Called also Gag-root, Puke-weed, Asthma-weed and Bladder-pod Lobelia. July–Nov.

11. Lobelia Kàlmii L. Brook or Kalm's Lobelia. (Fig. 3510.)

Lobelia Kalmii L. Sp. Pl. 930. 1753.

Perennial by short offsets, glabrous throughout, or sparingly pubescent below; stem leafy, erect, paniculately branched, rarely simple, slender, 6′–20′ high. Lower and basal leaves spatulate, obtuse, narrowed into short petioles, sparingly repand-denticulate, or entire, 6″–12″ long, 1½′–2½′ wide; upper leaves sessile, usually longer and narrower, linear, linear-oblong, or narrowly spatulate, the uppermost acute; flowers light blue, 4″–5″ long, in loose racemes; lower bracts linear-lanceolate, the upper subulate; pedicels nearly filiform, 4″–12″ long, usually 2-glandular or 2-bracteolate near the middle; calyx-lobes lanceolate-subulate, longer than the turbinate tube, the sinuses not appendaged; capsule wholly inferior, not inflated, campanulate or subglobose, about 2″ long.

On wet banks, and in wet meadows, Nova Scotia to New Jersey, west to Ontario, the Northwest Territory, Ohio and Michigan. July–Sept.

12. Lobelia Nuttàllii R. & S. Nuttall's Lobelia. (Fig. 3511.)

Lobelia gracilis Nutt. Gen. 2: 77. 1818. Not Andr.
Lobelia Nuttallii R. & S. Syst. 5: 39. 1819.

Annual, or perhaps biennial, glabrous throughout, or puberulent below; stem weak, usually reclining, very slender, loosely branched, at least when old, 1°–3° long. Basal leaves spatulate to oval, obtuse, mostly petioled, 6″–12″ long, slightly repand, or entire; stem leaves distant, linear, linear-oblong, or slightly spatulate, longer and narrower, entire or sparingly glandular-denticulate; flowers 2½″–4″ long, pale blue, loosely racemose; bracts linear or the upper subulate; pedicels filiform, 2″–4″ long, naked, or minutely 2-bracteolate near the base; calyx-lobes subulate, longer than the depressed-hemispheric strongly ribbed tube, the sinuses unappendaged; capsule depressed-globose, half-inferior, about 1″ long.

In sandy soil, New Jersey and Pennsylvania to Florida and Georgia. June–Sept.

13. Lobelia Cánbyi A. Gray. Canby's Lobelia. (Fig. 3512.)

Lobelia Canbyi A. Gray, Man. Ed. 5, 284. 1867.

Annual, slightly puberulent, usually glabrous; stem erect, slender, paniculately branched, or simple, 2°–3° high. Stem leaves linear or linear-oblong, ½′–1½′ long, ½″–1½″ wide, the lower obtuse, sometimes slightly repand-denticulate, the upper acute, narrower, entire; flowers racemose, blue, 4″–5½″ long; lower bracts linear, the upper subulate; pedicels erect or ascending, naked, filiform, 1″–3″ long; calyx-lobes linear-subulate, glandular-denticulate, equalling or somewhat longer than the narrowly turbinate tube, mostly shorter than the tube of the corolla; capsule oblong-turbinate, 2″ long, shorter than the calyx-tube.

Swamps, New Jersey to South Carolina. July–Sept.

Family 41. CICHORIÀCEAE Reichenb. Fl. Excurs. 248. 1831.

Chicory Family.

Herbs (two Pacific Island genera trees), almost always with milky, acrid or bitter juice, alternate or basal leaves, and yellow, rarely pink, blue purple or white flowers in involucrate heads (anthodia). Bracts of the involucre in 1 to several series. Receptacle of the head flat or flattish, naked, scaly (paleaceous) smooth, pitted, or honeycombed. Flowers all alike (heads homogamous), perfect. Calyx-tube completely adnate to the ovary, its limb (pappus) of scales, or simple or plumose bristles, or both, or wanting. Corolla gamopetalous, with a short or long tube, and a strap-shaped (ligulate) usually 5-toothed limb (ray). Anthers connate into a tube around the style, the sacs sagittate or auricled at the base, not tailed, usually appendaged at the summit, the simple pollen-grains usually 12-sided. Ovary 1-celled; ovule 1, anatropous; style very slender, 2-cleft, or 2-lobed, the lobes minutely papillose. Fruit an achene. Seed erect; endosperm none; radicle narrower than the cotyledons.

About 65 genera and 1400 species, of wide geographic distribution. The family is also known as Liguliflorae, and is often regarded as a tribe of the Compositae.

✲ Pappus of scales, or of scales and bristles, or none (see No. 18).

Flowers blue or white; pappus of blunt scales. — 1. *Cichorium.*
Flowers yellow.
  Bracts of the involucre membranous, or herbaceous.
    Pappus none; achenes 20–30-nerved. — 2. *Lapsana.*
    Pappus none; achenes 8–10-ribbed. — 3. *Serinea.*
    Pappus of rounded scales, with or without an inner series of bristles. — 4. *Adopogon.*
  Bracts of the involucre thickened and keeled after flowering; pappus none. — 5. *Arnoseris.*

✲ ✲ Pappus, at least some of it, of plumose bristles.

Receptacle chaffy. — 6. *Hypochaeris.*
Receptacle naked.
  Plume-branches of the pappus not interwebbed.
    Flowers yellow; plants scapose, the leaves basal. — 7. *Leontodon.*
    Flowers yellow; plants leafy-stemmed. — 8. *Picris.*

Flowers pink. 9. *Ptiloria.*
Plume-branches of the pappus interwebbed. 10. *Tragopogon.*

* * * Pappus of simple bristles (of soft white scales with or without bristles in No. 18).

† *Receptacle with a few deciduous bristles; flowers yellow.* 11. *Malacothrix.*

†† *Receptacle naked.*

1. Achenes spinulose, or with short processes near the summit.
Heads few- (6–15-) flowered, yellow; stem branching. 12. *Chondrilla.*
Heads many-flowered, yellow, solitary on scapes. 13. *Taraxacum.*

2. Achenes smooth, or papillose, not spinulose toward the summit.

(a) Achenes flattened.
Achenes truncate, not beaked; flowers yellow. 14. *Sonchus.*
Achenes narrowed at the summit, or beaked; flowers blue or yellow. 15. *Lactuca.*

(b) Achenes cylindric, or prismatic.
Achenes terete, not narrowed either at the base or summit; flowers pink or purple. 16. *Lygodesmia.*
Achenes narrowed at the base, narrowed or beaked at the summit; flowers yellow.
Achenes slender-beaked.
Pappus-bristles not surrounded by a villous ring at base.
Pappus of slender simple bristles. 17. *Agoseris.*
Pappus of narrow soft scales, with or without some slender bristles. 18. *Nothocalais.*
Pappus-bristles surrounded by a villous white ring at base. 19. *Sitilias.*
Achenes merely narrowed above, not beaked. 20. *Crepis.*
Achenes narrowed at the base, otherwise columnar, truncate (except in 2 species of *Hieracium*).
Flowers yellow, orange, or red. 21. *Hieracium.*
Flowers white, cream-color, or purple. 22. *Nabalus.*

1. CICHÒRIUM L. Sp. Pl. 813. 1753.

Erect branching herbs, with alternate and basal leaves, those of the stem and branches usually very small and bract-like, and large heads of blue purple pink or white flowers, peduncled, or in sessile clusters along the branches. Involucre of 2 series of herbaceous bracts, the outer somewhat spreading, the inner erect and subtending, or partly enclosing, the outer achenes. Receptacle flat, naked, or slightly fimbrillate. Rays truncate and 5-toothed at the apex. Anthers sagittate at the base. Style-branches slender, obtusish. Achenes 5-angled or 5-ribbed, truncate, not beaked. Pappus of 2 or 3 series of short blunt scales. [From the Arabic name.]

About 8 species, natives of the Old World.

1. Cichorium Íntybus L. Chicory. Wild Succory. Blue Sailors. Bunk. (Fig. 3513.)

Cichorium Intybus L. Sp. Pl. 813. 1753.

Perennial from a long deep tap-root; stems slightly hispid, stiff, much branched, 1°–3° high. Basal leaves spreading on the ground, runcinate-pinnatifid, spatulate in outline, 3′–6′ long, narrowed into long petioles; upper leaves much smaller, lanceolate or oblong, lobed or entire, clasping and auricled at the base; heads numerous, 1′–1½′ broad, 1–4 together in sessile clusters on the nearly naked or bracted branches; inner bracts of the involucre about 8; flowers bright blue, or sometimes white.

Roadsides, fields and waste places, Nova Scotia to Minnesota, North Carolina, Nebraska and Missouri. Abundant eastward. The ground-up root is used as a substitute or adulterant for coffee. Flowers usually closed by noon. July–Oct.

Cichorium Intybus divaricàtum DC. Prodr. 7: 84. 1838.

Some or all the heads on stout spreading peduncles 1′–4′ long. Frequent with the type.

2. LÁPSANA L. Sp. Pl. 811. 1753.

Annual erect branching herbs, with alternate dentate or pinnatifid leaves, and small panicled slender-peduncled heads of yellow flowers. Involucre nearly cylindric, its principal bracts in 1 series, nearly equal, with a few exterior small ones at the base. Receptacle flat, naked. Rays truncate and 5-toothed at the apex. Anthers sagittate at the base. Style-branches slender. Achenes obovate-oblong, 20–30-nerved, somewhat flattened, narrowed below, rounded at the summit. Pappus none. [Greek, *lampsana*, the name of a crucifer.]

About 9 species, natives of the Old World.

1. Lapsana commùnis L. Nipplewort. Succory Dock-cress. (Fig. 3514.)

Lapsana communis L. Sp. Pl. 811. 1753.

Stem paniculately branched, glabrous above, more or less hispid-pubescent below, 1°–3½° high. Lower leaves ovate, repand-dentate, obtuse, thin, pubescent, or glabrate, petioled, 2′–4′ long, often with

2–6 lobes on the petiole, the uppermost oblong or lanceolate, sessile, acute, much smaller, mostly entire; heads very numerous, 3″–6″ broad; involucre oblong-cylindric, 2″–3″ high, of about 8 linear glaucous principal bracts and several very small outer ones.

Along roadsides and in waste places, Quebec and Ontario to New Jersey and Pennsylvania. Also on the Pacific Coast. Naturalized from Europe. Called also Bolgan-leaves, Ballogan. June–Sept.

3. SERÍNIA Raf. Fl. Ludov. 149. 1817.

[Apogon Ell. Bot. S. C. & Ga. 2: 267. 1824.]

Low glaucescent branching annual herbs, with alternate clasping entire or lobed leaves, or those of the stem sometimes appearing as if opposite, and few small long-peduncled heads of yellow flowers. Involucre broadly campanulate, its bracts about 8, equal, membranous, becoming concave after flowering. Receptacle flat, naked. Rays truncate and 5-toothed at the apex. Anthers sagittate at the base. Style-branches slender. Achenes obovoid, 8–10-ribbed, contracted at the base, rounded at the summit. Pappus none, or a mere vestige. [Greek, small chicory.]

Three known species, natives of the southern United States.

1. Serinia oppositifòlia (Raf.) Kuntze. Serinia. (Fig. 3515.)

Krigia oppositifolia Raf. Fl. Ludov. 57. 1817.
Apogon humilis Ell. Bot. S. C. & Ga. 2: 267. 1824.
Serinia oppositifolia Kuntze, Rev. Gen. Pl. 364. 1891.

Glabrous throughout, or slightly glandular-pubescent along the ends of the peduncles, branched from the base, 4′–10′ high. Basal and lower leaves petioled, oblong-lanceolate or spatulate in outline, acute or obtuse, entire, lobed or pinnatifid, 3′–5′ long, 2″–6″ wide; upper leaves mainly sessile, clasping, alternate, or appearing as if opposite, usually entire, smaller; peduncles very slender, sometimes 4′ long; heads 1½″–2″ broad; bracts of the involucre acute or acuminate, about the length of the rays.

In fields, Missouri (according to Tracy); Kansas to Texas, east to South Carolina and Florida. March–May.

4. ADOPÒGON Neck. Elem. 1: 55. 1790.

[Krigia Schreb. Gen. Pl. 532. 1791.]

Annual or perenuial herbs, with scapose or leafy stems, basal or alternate, entire sinuate-dentate or pinnatifid leaves, and small or middle-sized heads of yellow or orange flowers, solitary at the end of the scape or its branches. Involucre campauulate, its herbaceous bracts in 1 or 2 series, with no exterior shorter ones. Receptacle flat, naked. Rays truucate and 5-toothed at the apex. Anthers sagittate at the base. Style-branches slender, obtusish. Achenes turbinate or oblong, 15–20-ribbed, truncate. Pappus in 1 or 2 series, the outer of thin broad rounded scales, the inner of slender naked bristles, or these sometimes wanting in the southwestern *A. occidentale*. [Greek, a pleasing beard.]

Five known species, natives of North America.

Stem 1-leaved and branched above, bearing 2–6 heads.	1. *A. Virginicum.*
Scape naked, monocephalous.	
Head about 1′ broad; pappus-bristles 12–20; perennial.	2. *A. Dandelion.*
Head 3″–7″ broad; pappus-bristles 5–7; annuals.	
Bracts of the involucre 5–8, remaining erect, firm, keeled.	3. *A. occidentale.*
Bracts of the involucre 8–18, at length reflexed, thin.	4. *A. Carolinianum.*

1. Adopogon Virgínicum (L.) Kuntze. Cynthia. Virginia Goatsbeard. (Fig. 3516.)

Tragopogon Virginicum L. Sp. Pl. 789. 1753.
Krigia amplexicaulis Nutt. Gen. 2: 127. 1818.
Cynthia Virginica Don, Edinb. Phil. Journ. 12: 309. 1829.
Adopogon Virginicum Kuntze, Rev. Gen. Pl. 304. 1891.

Perennial, glabrous and glaucous; stem 1°–2° high, 1-leaved and branched above, bearing 2–6 long-peduncled heads at its summit and an oblong clasping leaf below the middle. Basal leaves tufted, runcinate, sinuate, denticulate, or entire, 2′–7′ long, narrowed into margiued petioles; heads about 1½′ broad; involucre of 9–15 lanceolate nerveless bracts 3″–4″ long; achenes nearly oblong; pappus of 10–15 small oblong scales and an equal or greater uumber of capillary bristles; flowers orange to reddish orauge.

In moist woods and meadows, Massachusetts to southern Ontario and Manitoba, Georgia, Kentucky, Missouri and Kansas. Ascends to 4000 ft. in Virginia. May–Oct.

2. Adopogon Dandèlion (L.) Kuntze. Dwarf Dandelion or Goatsbeard. (Fig. 3517.)

Tragopogon Dandelion L. Sp. Pl. Ed. 2, 1111. 1763.
Krigia Dandelion Nutt. Gen. 2: 127. 1818.
Cynthia Dandelion DC. Prodr. 7: 89. 1838.
Adopogon Dandelion Kuntze, Rev. Gen. Pl. 304. 1891.

Perennial, acauleseent, glabrous and somewhat glaueous; scape 6′–18′ high, slender, leafless, with a single head. Stolons filiform, bearing globose tubers; leaves all basal, tufted, linear-lanceolate to spatulate, entire, denticulate, sinuate, or pinnatifid, narrowed at the base, 3′–6′ long, 2″–5″ wide; head about 1′ broad; involucre nearly ½′ high; pappus similar to that of the preceding species.

In moist soil, Maryland to Florida, west to Kansas and Texas. April–June.

3. Adopogon occidentàle (Nutt.) Kuntze. Western Dwarf Dandelion. (Fig. 3518.)

Krigia occidentalis Nutt. Journ. Acad. Phila. 7: 104. 1834.
Adopogon occidentale Kuntze, Rev. Gen. Pl. 304. 1891.

Annual, acauleseent; scapes tufted, 2′–8′ high, usually glandular, at least above, bearing a single head 5″–10″ broad. Leaves basal, lanceolate to obovate, entire to pinnatifid, mostly shorter than the scapes; involucre 2″–3″ high, its bracts 5-8, lanceolate, becoming ovate-lanceolate to ovate, firm and keeled at maturity, remaining erect; achenes turbinate, transversely wrinkled; pappus of 5 obovate scales and usually 5 alternating bristles.

Prairies, southern Missouri to Texas.

4. Adopogon Caroliniànum (Walt.) Britton. Carolinia Dwarf Dandelion. Krigia. (Fig. 3519.)

Hyoseris Virginica L. Sp. Pl. 809. 1753. Not *Tragopogon Virginicum* L. 1753.
Hyoseris Caroliniana Walt. Fl. Car. 194. 1788.
Krigia Virginica Willd. Sp. Pl. 3; 1618. 1804.
Krigia Caroliniana Nutt. Gen. 2: 126. 1818.
Adopogon Carolinianum Britton, Mem. Torr. Club, 5: 346. 1894.

Annual, acauleseent; scapes usually several from the same root, very slender, glabrous or hispidulous, monocephalous, 1′–15′ high, simple, or sometimes branched at or near the base. Leaves commonly all basal, tufted, spatulate, lanceolate or linear, pinnatifid, sinuate, lobed, dentate or rarely entire, 1′–6′ long, narrowed at the base into usually margined petioles; head 3″–7″ broad; involucre of 9-18 linear-lanceolate bracts, reflexed after the fall of the narrowly turbinate somewhat 5-angled achenes; pappus usually of 5 round short scales and 5–10 long capillary bristles.

In dry, sandy soil, Maine to Ontario and Minnesota, Florida and Texas. April–Aug.

5. ARNÓSERIS Gaertn. Fr. & Sem. 2: 355. *pl. 157.* 1791.

A low annual scapose herb, glabrous, or nearly so, with tufted basal dentate or nearly entire leaves. Scapes several or numerous, simple or branched, upwardly thickened below the solitary heads of yellow flowers. Involucre campanulate, its bracts in 1 series, narrow, equal, thickened and keeled on the back after flowering, rarely with a few outer minute ones. Receptacle flat, pitted, not chaffy. Anthers sagittate. Style-branches obtuse. Achenes oval, 8–10-ribbed, narrowed below, truncate, or with a denticulate margin. Pappus none. [Greek, lamb-succory.]

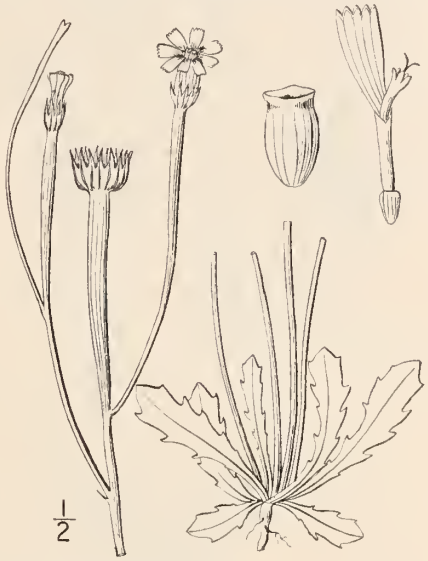
A monotypic genus of western Europe.

1. Arnoseris mínima (L.) Dumort. Lamb Succory. (Fig. 3520.)

Hyoseris minima L. Sp. Pl. 879. 1753.
Arnoseris pusilla Gaertn. Fr. & Sem. 2: 355. 1791.
Arnoseris minima Dumort. Fl. Belg. 63. 1827.

Scapes slender, 3′–12′ high, leafless, simple, or with 1–4 branches mostly above the middle, gradually thickened and hollow upward for a space of an inch or more below the heads. Leaves oblanceolate, obovate, or oblong, 1′–3′ long, 3″–10″ wide, usually coarsely and sharply toothed, narrowed into margined petioles; heads 8″ broad, or less; bracts of the involucre linear-lanceolate, acuminate, strongly keeled after flowering, 2″–4″ long, curving over the achenes.

Mount Desert Island, Maine. Fugitive from Europe. Also called Dwarf Swine's- or Hog's-Succory, Dwarf Nipplewort. Summer.



6. HYPOCHAÈRIS L. Sp. Pl. 810. 1753.

Mostly perennial herbs, with scapose, often branched stems and mostly basal tufted leaves, pinnatifid to entire, those of the scapes few, scale-like, very small, or none. Heads mostly large, long-peduncled. Flowers yellow. Involucre oblong-cylindric to campanulate, its bracts herbaceous, imbricated in several series, appressed, the outer smaller. Receptacle flat, chaffy. Anthers sagittate. Style-branches slender, obtusish. Achenes oblong to linear, 10-ribbed, somewhat narrowed below, contracted above into a long or short beak, or the outer truncate. Pappus of 1 row of plumose bristles, sometimes with some shorter simple ones. [Greek, for pigs, which are fond of its roots.]

About 50 species, natives of Europe, Asia and South America.

1. Hypochaeris radicàta L. Long-rooted Cat's-ear. Gosmore. (Fig. 3521.)

Hypochaeris radicata L. Sp. Pl. 811. 1753.

Perennial; stems several together, glabrous, slender, 1°–2° high, bracted, or rarely simple, bearing a few scales. Leaves spreading on the ground, oblanceolate to obovate in outline, pinnatifid-lobed to dentate, 2′–6′ long, hirsute on both sides; involucre oblong-cylindric, about 1′ high, its bracts glabrous, or sparingly pubescent; heads 1′ broad or more; chaff of the receptacle of narrow soft pointed scales; achenes rough, all with very slender beaks longer than the body; flowers longer than the involucre.

In waste places, southern New Jersey. Also in California. Adventive or naturalized from Europe. Native also of Asia. May–Oct.

Hypochaeris glàbra L., the smooth Cat's-ear, a smaller species, with nearly or quite glabrous leaves, flowers scarcely longer than the involucre, and the outer achenes truncate, has been found as a waif in Maine, and is naturalized or adventive on the Pacific coast.

7. LEÓNTODON L. Sp. Pl. 798. 1753.

Perennial scapose herbs, with tufted basal, mostly pinnatifid leaves, branched and scaly, or simple and naked scapes, and large heads of yellow flowers, solitary at the end of the scape or of its branches. Involucre ovoid or oblong, its principal bracts in 1 or 2 series, nearly equal, with several series of short outer ones. Receptacle flat, fimbrillate, villous, or somewhat honeycombed. Rays truncate and 5-toothed at the apex. Anthers sagittate at the base. Style-branches slender. Achenes oblong or linear, finely striate, contracted or beaked at the summit. Pappus of 1 or 2 series of plumose persistent brownish bristles, somewhat broadened at the base, or the outer scale-like and simple. [Greek, lion's tooth.]

About 45 species, natives of the Old World.

Plant nearly glabrous; scape commonly branched; pappus-bristles all plumose. 1. *L. autumnale.*
Plant somewhat hirsute; scape simple; outer pappus of outer achenes simple. 2. *L. nudicaule.*

1. Leontodon autumnàle L. Fall Dandelion. Autumnal Hawkbit. Lion's-tooth. (Fig. 3522.)

Leontodon autumnale L. Sp. Pl. 798. 1753.
Apargia autumnalis Hoffm. Deutsch. Fl. Ed. 2, 2: 113. 1800.

Plant glabrous or very nearly so throughout; scape slender, usually branched and scaly, 6′–2° high. Leaves narrowly oblong to linear-lanceolate, pinnatifid into narrow lobes, or some of them coarsely dentate, 3′–8′ long, 3″–12″ wide, acuminate at the apex, narrowed into rather short petioles; heads several, rarely solitary, about 12″–15″ broad; involucre oblong, glabrous or slightly pubescent; achenes tapering into a short beak, or the outer ones nearly terete; pappus-bristles all plumose.

In fields and along roadsides, Newfoundland and Ontario to New Jersey, Pennsylvania and Ohio. Naturalized from Europe. Native also of Asia. June–Nov.

2. Leontodon nudicaùle (L.) Porter. Rough or Hairy Hawkbit. (Fig. 3523.)

Crepis nudicaulis L. Sp. Pl. 805. 1753.
Leontodon hirtum L. Sp. Pl. Ed. 2, 1123. 1763.
Leontodon nudicaule Porter, Mem. Torr. Club, 5: 348. 1894.

Plant more or less hirsute; scape simple, slender, 4′–12′ high, minutely scaly, or naked. Leaves linear-oblong to narrowly spatulate, acute or obtuse, not acuminate, nearly entire, coarsely sinuate-dentate or sometimes pinnatifid, 2′–5′ long, 3″–8″ wide, narrowed into petioles; head solitary at the end of the scape, 5″–10″ broad; involucre canescent or pubescent; outer achenes with an outer pappus of simple narrow scales and an inner one of plumose bristles.

In ballast and waste places about the eastern seaports. Also at Seidersville, Penn. (Bechdoldt), and on Vancouver Island (Macoun). Adventive from Europe. June–Oct.

8. PÌCRIS L. Sp. Pl. 792. 1753.

Erect hispid, mostly branching, leafy herbs, with alternate leaves (in our species), and rather large, usually corymbose or panicuiate heads of yellow flowers. Involucre campanulate or cup-shaped, its principal bracts in 1 series, nearly equal, with 2–3 series of small or large exterior spreading ones. Receptacle flat, short-fimbrillate. Rays truncate and 5-toothed at the apex. Anthers sagittate at the base. Style-branches slender. Achenes linear or oblong, somewhat incurved, terete or angled, 5–10-ribbed and transversely wrinkled, narrowed at the base and summit, or beaked in some species. Pappus of 1 or 2 series of slender plumose bristles. [Greek, bitter.]

About 35 species, natives of the Old World, one perhaps indigenous in Alaska.

Outer involucral bracts linear; achenes not beaked. 1. *P. hieracioides.*
Outer involucral bracts ovate, foliaceous; achenes short-beaked. 2. *P. echioides.*

1. Picris hieracioides L.

Hawkweed Picris.

(Fig. 3524.)

Picris hieracioides L. Sp. Pl. 792. 1753.

Biennial, more or less hispid, much branched, 1°–3° high. Leaves lanceolate or oblong-lanceolate, dentate, or nearly entire, the basal narrowed into petioles, acute, often 6′ long, those of the stem mostly sessile and smaller; heads numerous, ½′–1′ broad; involucre 4″–6″ high, its outer bracts linear, subulate, spreading, the inner linear-lanceolate, acuminate; pappus copious, nearly white.

In waste places, Illinois, Pennsylvania, New Jersey, and in ballast about the seaports. Adventive from Europe. Native also of Asia. Very bitter. June-Sept. Old name Langdebeef.

2. Picris echioides L. Bristly Ox-tongue. (Fig. 3525.)

Picris echioides L. Sp. Pl. 792. 1753.
Helmintha echioides Gaertn. Fruct. & Sem. 2: 368. 1802.

Annual or biennial, branched, hispid; stem about 2½° high. Basal and lower leaves spatulate or oblong, obtuse, repand-dentate, 2′–6′ long, narrowed into petioles; upper leaves sessile and clasping, oblong or lanceolate, smaller, the uppermost mainly acute and entire; heads numerous, rather crowded, short-peduncled, about ½′ broad; outer bracts of the involucre 4 or 5, foliaceous, ovate, acute, hispid-ciliate, the inner ones lanceolate, membranous; achenes beaked.

In waste places, Nova Scotia and Ontario, and in ballast about the seaports. Fugitive from Europe. July–Sept. Called also Bugloss and Bugloss Picris.

9. PTILÒRIA Raf. Atl. Journ. 145. 1832.

[STEPHANOMERIA Nutt. Trans. Amer. Phil. Soc. (II) 7: 427. 1841.]

Annual or perennial, mostly glabrous, often glaucous herbs, with erect, simple or branched, usually rigid stems, alternate or basal, entire dentate or runcinate-pinnatifid leaves, those of the stem and branches often reduced to subulate scales, and small erect heads of pink flowers, paniculate, or solitary at the ends of the branches, opening in the morning. Involucre cylindric or oblong, its principal bracts few, equal, scarious-margined, slightly united at the base, with numerous short exterior ones and sometimes a few of intermediate length. Receptacle flat, naked. Anthers sagittate at the base. Style-branches slender. Achenes oblong or linear, terete or columnar, 5-ribbed, truncate or beaked at the summit, the ribs smooth or rugose. Pappus of 1 series of rather rigid plumose bristles. [Greek, referring to the feathery pappus.]

About 16 species, natives of western and central North America.

Involucre about 5″ high; pappus brownish, plumose to near the base. 1. *P. pauciflora.*
Involucre about 4″ high; pappus white, plumose quite to the base. 2. *P. tenuifolia.*

1. Ptiloria pauciflòra (Torr.) Raf. Brown-plumed Ptiloria. (Fig. 3526.)

Prenanthes? pauciflora Torr. Ann. Lyc. N. Y. 2: 210. 1827.
Ptiloria pauciflora Raf. Atl. Journ. 145. 1832.
Stephanomeria runcinata Nutt. Trans. Am. Phil. Soc. (II) 7: 427. 1841.

Perennial; stem rather stout, striate, rigid, divergently branched, 1°–2° high. Basal and lower leaves runcinate-pinnatifid, 1′–2½′ long, 3″–6″ wide, the upper all short and narrowly linear or reduced to scales; heads somewhat racemose-paniculate along the branches, usually about 5-flowered; involucre 4″–5″ high; rays 1″–2″ long; pappus brownish, plumose to near the base.

Plains, Nebraska and Wyoming to Texas and California. Summer.

2. Ptiloria tenuifòlia (Torr.) Raf. White-plumed Ptiloria. (Fig. 3527.)

Prenanthes? tenuifolia Torr. Ann. Lyc. 2: 210. 1828.
Ptiloria tenuifolia Raf. Atl. Journ. 145. 1832.
Lygodesmia minor Hook. Fl. Bor.Am. 1: 205. *pl. 103 A.* 1833.
Stephanomeria minor Nutt. Trans. Am. Phil. Soc. (II) 7: 427. 1841.

Similar to the preceding species, but commonly lower, bushy-branched, the branches ascending. Basal leaves runcinate-pinnatifid, those of the stem linear or filiform, entire, or sometimes runcinate-dentate, the uppermost reduced to small scales; heads numerous, usually solitary at the ends of the branchlets; involucre about 4″ high; pappus bright white, very plumose to the base.

Plains and dry, rocky soil, Northwest Territory to western Nebraska and Texas to British Columbia, Arizona and California. May–Aug.

10. TRAGOPÒGON L. Sp. Pl. 789. 1753.

Biennial or perennial, erect usually branched, somewhat succulent herbs, with slender fleshy tap-roots, alternate entire linear-lanceolate long-acuminate leaves, clasping at the base, and long-peduncled large heads of yellow or purple flowers, opening in the early morning, usually closed by noon. Involucre cylindric or narrowly campanulate, its bracts in 1 series, nearly equal, acuminate, united at the base. Rays truncate and 5-toothed at the apex. Anthers sagittate at the base. Style-branches slender. Achenes linear, terete, or 5-angled, 5–10-ribbed, terminated by slender beaks, or the outermost beakless. Pappus-bristles in 1 series, plumose, connate at the base, the plume-branches interwebbed. [Greek, goats-beard.]

About 35 species, natives of the Old World.

Flowers yellow; involucral bracts equalling or shorter than the rays. 1. *T. pratensis.*
Flowers purple; involucral bracts much longer than the rays. 2. *T. porrifolius.*

1. Tragopogon praténsis L. Yellow Goat's-beard. Meadow Salsify. (Fig. 3528.)

Tragopogon pratensis L. Sp. Pl. 789. 1753.

Stem branched, 1¼°–3° high. Leaves keeled, tapering from the broad, more or less clasping base to a very long acuminate tip, the lower sometimes 10′ long and 1′ wide; peduncles thickened at the top; heads 1′–2½′ broad; bracts of the involucre about 8, lanceolate, acuminate, shorter than or equalling (rarely exceeding) the yellow rays; marginal achenes striate, smooth or roughened.

In fields and waste places, New Brunswick to New Jersey, Ontario, Ohio and Manitoba. Naturalized from Europe. June–Oct. Called also Buck's-beard, Noon-flower, Star of Jerusalem, Noontide, Joseph's flower, Go-to-bed-at-noon.

2. Tragopogon porrifòlius L. Oyster Plant. Salsify. Purple Goat's Beard. (Fig. 3529.)

Tragopogon porrifolius L. Sp. Pl. 789. 1753.

Taller, sometimes 4½° high. Peduncles very much thickened and hollow for 1 to 3 inches below the heads; heads 2′–4′ broad, very showy; bracts of the involucre linear-lanceolate, acuminate, usually much longer than the purple rays; achenes sometimes 2′ long, the outer ones covered with scale-like tubercles, especially on the ribs below.

In fields and waste places, Ontario to New Jersey, west to Minnesota and Nebraska, mostly escaped from gardens, where it is common. Native of Europe. Called also Vegetable Oyster, Jerusalem Star, Nap-at-noon, Oyster-root. Naturalized as a weed on the Pacific Coast. The root is the familiar vegetable known as Oyster Plant. An apparent hybrid between this and the preceding species has been noticed at New Brunswick, N. J. June–Oct.

11. MALÁCOTHRIX DC. Prodr. 7: 192. 1838.

Annual or perennial, branching or scapose herbs, with alternate or basal, mostly pinnatifid leaves, and long-peduncled panicled or solitary heads of yellow or rarely white flowers. Involucre campanulate, its principal bracts in 1 or 2 series, equal or nearly so, with several series of shorter exterior ones. Receptacle flat, naked or bristly. Rays truncate and 5-toothed at the apex. Anthers sagittate at the base. Style-branches slender. Achenes oblong or linear, glabrous, 10–15-ribbed, 4 or 5 of the ribs usually more prominent than the others, truncate, or margined and 4–5-toothed at the summit. Pappus-bristles in 2 series, the inner naked or minutely serrulate, slender, coherent at the base and deciduous in a ring, the outer few (1–8), more persistent, or all deciduous in our species. [Greek, soft-hair, in allusion to the soft pappus.]

About 15 species, natives of the western and southwestern United States and lower California.

1. Malacothrix sonchoides (Nutt.) T. & G. Malacothrix. (Fig. 3530.)

Leptoseris sonchoides Nutt. Trans. Am. Phil. Soc. (II) 7: 439. 1841.
Malacothrix sonchoides T. & G. Fl. N. A. 2: 486. 1843.

Annual, glabrous throughout, or slightly glandular; stem branched, 6′–12′ high. Leaves somewhat fleshy, oblong or linear-oblong in outline, pinnatifid and the lobes dentate with mucronate-pointed teeth, the basal ones 1½′–3′ long, narrowed into short broad petioles, those of the stem smaller, sessile; heads several or numerous, 8″–13″ broad; principal bracts of the involucre linear, acute, scarious-margined, the outer short, oblong, obtuse, or acutish; achenes linear-oblong, margined at the summit by a 15-denticulate white border; pappus-bristles all deciduous.

On dry plains, western Nebraska and Kansas to California and New Mexico. May–Aug.

12. CHONDRÍLLA L. Sp. Pl. 796. 1753.

Perennial herbs, with stiff divaricately branched stems, the basal leaves large and mostly pinnatifid, those of the stem small, narrow, alternate, and few middle sized heads of yellow flowers mostly solitary at the ends of the branches. Involucre cylindric, several-flowered, its inner bracts in 1 or 2 series, nearly equal, with several series of small or minute outer ones. Receptacle flat, naked. Rays truncate and 5-toothed at the summit. Anthers sagittate at the base. Style-branches slender. Achenes oblong or linear, 4–5-angled, many-ribbed, more or less spiny near the summit, abruptly contracted into a beak. Pappus of copious soft white simple bristles. [Greek, lump, from the gummy matter borne on the stems of some species.]

About 18 species, natives of the Old World.

1. Chondrilla júncea L. Gum Succory. (Fig. 3531.)

Chondrilla juncea L. Sp. Pl. 796. 1753.

Stem rush-like, hirsute at the base, glabrous above, much branched, 1°–3° high. Basal leaves runcinate-pinnatifid, those of the stem linear or linear-lanceolate, acute, dentate or entire, sessile, ½′–1½′ long, ½″–1½″ wide; heads terminal and lateral on the branches, short-peduncled or sessile, 4″–6″ broad; involucre glabrous or nearly so, about 4″ high, its inner bracts narrowly linear; achenes muricate and spiny near the summit, slightly shorter than the filiform beak.

In dry fields and waste places, Maryland and Virginia. Naturalized from Continental Europe. July–Aug. Called also Naked-weed, Skeleton-weed.

13. TARÁXACUM Hall. Stirp. Helv. 1: 23. 1768.

Perennial acaulescent herbs, with basal tufted pinnatifid or sinuate-dentate leaves, and large heads of yellow flowers, solitary, or very rarely 2 or 3 together at the ends of naked hollow scapes. Involucre oblong or campanulate, its inner bracts in 1 series, nearly equal, slightly united at the base, the outer of several series of shorter somewhat spreading ones, often reflexed at maturity. Receptacle flat, naked. Rays truncate and 5-toothed at the summit. Anthers sagittate at the base. Style-branches slender, obtusish. Achenes oblong or linear-fusiform, 4–5-angled, 5–10-nerved, roughened or spinulose, at least above, tapering into a very slender beak. Pappus of numerous filiform unequal simple persistent bristles. [Name of some wild succory, probably of Arabic or Persian origin.]

About 20 species, natives of the northern hemisphere and southern South America.

Outer involucral bracts reflexed; achenes greenish brown, the beak 2–3 times their length. 1. *T. Taraxacum.*

Outer involucral bracts spreading or ascending; achenes red, the beak not more than twice their length. 2. *T. erythrospermum.*

1. Taraxacum Taráxacum (L.) Karst. Dandelion. Blowball. (Fig. 3532.)

Leontodon Taraxacum L. Sp. Pl. 798. 1753.
T. officinale Weber, Prim. Pl. Holst. 56. 1780.
T. Dens-leonis Desf. Fl. Atlant. 2: 228. 1800.
T. Taraxacum Karst. Deutsch. Fl. 1138. 1880–83.

Root thick, deep, often 10′ long, bitter. Leaves oblong to spatulate in outline, usually pubescent, at least when young, acute or obtuse, pinnatifid, sinuate-dentate or rarely nearly entire, rather succulent, 3′–10′ long, ½′–2½′ wide, narrowed into petioles; scape erect, 2′–18′ high; head 1′–2′ broad; containing very numerous golden-yellow flowers (150–200), inner bracts of the involucre linear or linear-lanceolate, the outer similar, shorter, not glaucous, reflexed, all acute; achenes greenish-brown, fusiform, spinulose above, narrowed into a filiform beak 2–3-times their length, which support the copious white pappus, the fruiting mass of which becomes globose when ripe.

In fields and waste places. Perhaps indigenous northward, southward naturalized as a weed from Europe. Also in Asia and distributed as a weed in all civilized parts of the world. Jan.–Dec. Called also Lion's-tooth, Cankerwort, Milk-, Witch-, or Yellow-Gowan, Irish Daisy, Monk's-head, Priest's Crown, Puff-ball.

Taraxacum Taráxacum alpinum (Koch) Porter, Mem. Torr. Club, 5: 349. 1894.

Taraxacum officinale var. *alpinum* Koch, Fl. Germ. & Helv. 428. 1837.

Outer bracts of the involucre spreading, ovate or ovate-lanceolate. Labrador to British Columbia, south in the Rocky Mountains to Utah and Colorado and in the Sierra Nevada to California. Also in Europe. Probably a distinct species, and indigenous.

2. Taraxacum erythrospérmum Andrz. Red-seeded Dandelion. (Fig. 3533.)

Taraxacum erythrospermum Andrz. in Bess. Enum. Pl. Volh. 75. 1821.

Similar to the preceding species, the leaves glabrous, very deeply runcinate-pinnatifid or pinnately divided into narrower triangular-lanceolate usually long-pointed segments; scapes glabrous, or pubescent above; heads rarely more than 1′ broad, 70–90-flowered; bracts of the involucre glaucous, the outer lanceolate, spreading or ascending, the inner linear, longer, each usually with an appendage just below the tip; flowers sulphur-yellow, the outer rays purplish without; achenes narrower, bright red, or red-brown, spinulose above, the filiform beak not more than twice their length; pappus dirty white.

In fields and woods, Maine to southern New York and Pennsylvania, and probably much more widely distributed. Naturalized from Europe? April-June.

14. SÓNCHUS L. Sp. Pl. 793. 1753.

Annual or perennial succulent herbs, with alternate, mostly auriculate-clasping, entire dentate lobed or pinnatifid, prickly-margined leaves, and large or middle-sized, peduncled corymbose or paniculate heads of yellow flowers. Involucre ovoid or campanulate, usually becoming thickened and more or less conic at the base when old, its bracts herbaceous or membranous, imbricated in several series, the outer successively smaller. Receptacle flat, naked. Rays truncate and 5-toothed at the apex. Anthers sagittate at the base. Style-branches slender. Achenes oval, oblong, or linear, more or less flattened, 10–20-ribbed, somewhat narrowed at the base, truncate. Pappus of very copious soft white simple capillary bristles, usually falling away connected, sometimes with 1 or 2 stouter ones which fall separately. [The Greek name of the Sow-thistle.]

About 45 species, natives of the Old World. Besides the following, another occurs on the Pacific Coast.

Involucre glandular-pubescent; heads nearly 1′ high. 1. *S. arvensis*.
Involucre glabrous; heads 6″–8″ high.
Auricles of the leaves acute; achenes striate and transversely wrinkled. 2. *S. oleraceus*.
Auricles rounded; achenes ribbed, not transversely wrinkled. 3. *S. asper*.

1. Sonchus arvénsis L. Corn Sow-Thistle. Milk Thistle. (Fig. 3534.)

Sonchus arvensis L. Sp. Pl. 793. 1753.

Perennial by deep roots and creeping rootstocks, glabrous; stem leafy below, pauiculately branched and nearly naked above, 2°–4° high. Lower and basal leaves runcinate-pinnatifid, often 12′ long, spinulose-dentate, narrowed into short petioles, the upper pinnatifid or entire, lauceolate, clasping; heads several or numerous, corymbose-paniculate, 1′–2′ broad, bright yellow, very showy; involucre nearly 1′ high, its bracts as also the peduncles glandular-bristly; achenes oblong, compressed, with about 10 rugose longitudinal ribs.

In low grounds along salt meadows and streams, New Jersey to Quebec and at Great Salt Lake, Utah, and in fields and along roadsides, Newfoundland to Minnesota. Naturalized from Europe. Native also of Asia. July–Oct. Called also Dindle, Gutweed, Swine Thistle, Tree Sow-Thistle.

2. Sonchus oleràceus L. Annual Sow-Thistle. Hare's Lettuce. (Fig. 3535.)

Sonchus oleraceus L. Sp. Pl. 794. 1753.

Aunual, with fibrous roots; stem leafy below, nearly simple, 1°–10° high. Basal and lower leaves petioled, lyrate-pinnatifid, 4′–10′ long, the terminal segment commonly large and triangular, the margins denticulate with mucronate or scarcely spiuy teeth; upper leaves pinnatifid, clasping by an auricled or sagittate base, the auricles acute or acuminate; uppermost leaves ofteu lanceolate and entire; heads several or numerous, pale yellow, 9″–15″ broad; involucre glabrous, 6″–8″ high; achenes flat, longitudinally ribbed and transversely rugose.

In fields and waste places, a common weed in most cultivated parts of the globe except the extreme north. Also in Central and South America. Naturalized from Europe. Called also Hare's Colewort or Thistle, Milk-weed, Milk Thistle, Milky Tassel, Swinies. The leaves used as a salad and as a pot herb. May–Nov.

3. Sonchus ásper (L.) All. Spiny or Sharp-fringed Sow-Thistle. (Fig. 3536.)

Sonchus oleraceus var. *asper*. L. Sp. Pl. 794. 1753.
Sonchus asper All. Fl. Ped. 1: 222. 1785.

Annual, similar to the preceding species; leaves undivided, lobed or sometimes pinnatifid, spinulose-dentate to spinulose-denticulate, the lower and basal ones obovate or spatulate, petioled, the upper oblong or lanceolate, clasping by an auricled base, the auricles rounded; heads several or numerous, 1′ broad or less; flowers pale yellow; involucre glabrous, about 6″ high; achenes flat, longitudinally ribbed.

In waste places throughout most of our area and in tropical and South America. Widely distributed as a weed in nearly all cultivated parts of the earth. Naturalized from Europe. May–Nov.

15. LACTÙCA L. Sp. Pl. 795. 1753.

Tall leafy herbs, with small panicled heads of yellow white or blue flowers, and alternate leaves. Involucre cylindric, its bracts imbricated in several series, the outer shorter, or of 1 or 2 series of principal nearly equal inner bracts, and several rows of short outer ones. Receptacle flat, naked. Rays truncate and 5-toothed at the summit. Anthers sagittate at the base. Style-branches mostly slender. Achenes oval, oblong or linear, flat, 3–5-ribbed on each face, narrowed above or contracted into a narrow beak, which is somewhat expanded at the summit into a small disk bearing the copious soft capillary white or brown pappus-bristles. [The Ancient Latin name, from *lac*, milk, referring to the milky juice.]

About 95 species, natives of the northern hemisphere.

* Pappus bright white.

1. Leaves spiny-margined and often with spiny or hispid midribs; flowers yellow.
Heads 6–12-flowered; involucre very narrow, 4″–6″ high. 1. *L. Scariola.*
Heads 12–20-flowered; involucre broader.
Involucre 8″–9″ high; achene about as long as its beak. 2. *L. Ludoviciana.*
Involucre 4″–6″ high; achene longer than its beak. 5. *L. sagittifolia.*

2. Leaves neither spiny-margined nor with spiny midribs.

(**a**) Achenes very thin, flat, contracted into filiform or tapering beaks.
Outer involucral bracts abruptly shorter than the inner; heads 4″–7″ high; flowers yellow.
Leaves, or some of them, pinnatifid.
Plant glabrous throughout, 3°–10° high. 3. *L. Canadensis.*
Leaves, at least their midribs, hirsute; plant 1°–6° high. 4. *L. hirsuta.*
Leaves entire or dentate, none of them pinnatifid.
Leaves oblong or oblong-lanceolate; achene longer than the beak. 5. *L. sagittifolia.*
Leaves lanceolate; achene about equalling the beak. 3. *L. Canadensis.*
Outer bracts gradually shorter; heads 8″–10″ high; flowers blue. 6. *L. pulchella.*

(**b**) Achenes beakless or with short necks, thickish; flowers blue.
Leaves oblong to ovate, acuminate, dentate. 7. *L. villosa.*
Leaves pinnatifid, the terminal segment commonly triangular. 8. *L. Floridana.*

* * Pappus brown; flowers blue. 9. *L. spicata.*

1. Lactuca Scariola L. Prickly Lettuce. (Fig. 3537.)

Lactuca Scariola L. Sp. Pl. Ed. 2, 1119. 1763.

Biennial, green and glaucous; stem stiff, leafy, usually paniculately branched, glabrous throughout, or hirsute at the base, 2°–7° high. Leaves oblong or oblong-lanceolate, spinulose-margined, denticulate or pinnatifid, sessile or auriculate-clasping, the lowest sometimes 10′ long and 3′ wide, the upper much smaller; midrib spinulose or hispid; heads 2″–4″ broad, 6–12-flowered; very numerous in an open panicle; involucre cylindric, 1″–1½″ thick, its outer bracts about one-third the length of the inner; rays yellow; achenes obovate-oblong, about as long as the filiform beak; pappus white.

In fields and waste places, New York and Pennsylvania to Minnesota and Missouri. A troublesome weed. Naturalized from Europe. Aug–Sept.

2. Lactuca Ludoviciàna (Nutt.) DC. Western Lettuce. (Fig. 3538.)

Sonchus Ludovicianus Nutt. Gen. 2: 125. 1818.
Lactuca Ludoviciana DC. Prodr. 7: 141. 1838.

Biennial, glabrous throughout, leafy up to inflorescence, paniculately branched, 2°–5° high. Leaves oblong to ovate-oblong, acute or acutish, 2′–4′ long, auriculate-clasping, spinulose-denticulate, sinuate-lobed, or pinnatifid with spinulose segments; heads 3″–5″ broad, numerous in an open panicle, their peduncles bracteolate; involucre cylindric or ovoid-cylindric, glabrous, 8″–9″ high, its bracts successively shorter and broader, the lower ones ovate; rays yellow; achenes oval to obovate, flat, about the length of their filiform beak; pappus white.

Plains and banks, Iowa, Minnesota and Dakota to Kansas and Texas. July–Sept.

3. Lactuca Canadénsis L. Wild or Tall Lettuce. Wild Opium. (Fig. 3539.)

Lactuca Canadensis L. Sp. Pl. 796. 1753.
Lactuca elongata Muhl.; Willd. Sp. Pl. 3: 1525. 1804.

Biennial or annual, glabrous throughout, somewhat glaucous; stem leafy up to the inflorescence, 3°–10° high, branching above into a narrow panicle. Leaves, or some of them, sinuate-pinnatifid, those of the stem sessile or auriculate-clasping, 2′–8′ long, the uppermost smaller, often lanceolate, acuminate and entire, the basal often 12′ long, narrowed into petioles; heads numerous, 2″–3″ broad; involucre cylindric, 4″–6″ high, its outer bracts shorter than the inner; rays yellow; achenes oval, flat, about as long as the filiform beak; pappus white.

In moist, open places, Nova Scotia to the Northwest Territory south to Georgia, Alabama, Louisiana and Arkansas. Called also Trumpetweed, Trumpet Milkweed, Trumpets and Fire-weed. June–Nov.

Lactuca Canadénsis montàna Britton.

Plant 1°–4° high; leaves all lanceolate and entire; bracts of the involucre purple or purplish. Pocono Mountain, Penn., and Catskill Mountains, N. Y.

4. Lactuca hirsùta Muhl. Hairy or Red Wood-Lettuce. (Fig. 3540.)

Lactuca hirsuta Muhl. Cat. 69. 1813.
Lactuca sanguinea Bigel. Fl. Bost. Ed. 2, 287. 1824.
Lactuca elongata var. *sanguinea* T. & G. Fl. N. A. 2: 496. 1843.

Similar to the preceding species, but commonly smaller and less leafy; stem 1°–6° high, naked and paniculately branched above, usually hirsute, at least below. Leaves, or most of them, sinuate-pinnatifid, pubescent on both sides, or on the midrib beneath, those of the stem mostly sessile or auriculate-clasping, 3′–7′ long, the uppermost sometimes lanceolate and entire, the basal petioled; heads numerous, 2″–3″ broad; involucre glabrous, 5″–9″ high; outer bracts shorter than the inner; rays reddish-yellow or paler; achenes oblong-oval, flat, about the length of the beak; pappus white.

In dry soil, Maine to Ontario, Minnesota, Alabama and Texas. Stem, peduncles and involucre often red or purple. July–Sept.

5. Làctuca sagittifòlia Ell. Arrow-leaved Lettuce. (Fig. 3541.)

L. sagittifolia Ell. Bot. S. C. & Ga. 2: 253. 1821–24.
Lactuca integrifolia Bigel. Fl. Bost. Ed. 2, 287. 1824. Not Nutt. 1818.
L. elongata var. *integ.* T. & G. Fl. N. A. 2: 496. 1843.

Biennial; stem glabrous throughout, or hirsute below, leafy nearly up to the usually paniculate inflorescence, 2°–6° high. Leaves oblong, oblong-lanceolate or lanceolate, acuminate or acute, entire or denticulate, the lower rarely pinnatifid, sometimes spinulose on the margins, those of the stem sessile or sagittate-clasping, 3′–6′ long, ½′–1½′ wide, the basal and lower ones petioled; heads commonly very numerous, 2″–4″ broad; involucre cylindric, 5″–7″ high, the outer bracts shorter than the inner; rays yellow or reddish; achenes oval, flat, longer than their filiform beaks; pappus white.

In dry, open soil, New Brunswick and Ontario to Georgia, Idaho and Nebraska. Called also Devil's-Iron Weed. July–Sept.

6. Lactuca pulchélla (Pursh) DC. Large-flowered Blue Lettuce. (Fig. 3542.)

Sonchus pulchellus Pursh, Fl. Am. Sept. 502. 1814.
Lactuca integrifolia Nutt. Gen. 2: 124. 1818.
Lactuca pulchella DC. Prodr. 7: 134. 1838.

Perennial, glabrous throughout, somewhat glaucous; stem rather slender, leafy up to the corymbose-paniculate inflorescence, 1°–3° high. Leaves linear-lanceolate, lanceolate or oblong, acute, entire, dentate, lobed or pinnatifid, those of the stem sessile or partly clasping, 2′–8′ long; 2″–18″ wide, the lowest and basal ones sometimes petioled; heads mostly numerous, 6″–10″ broad; branches and peduncles scaly; involucre well imbricated, 8″–10″ high, its outer bracts successively shorter, ovate-lanceolate; rays bright blue or violet; achenes oblong-lanceolate, flat, twice as long as their tapering beaks; pappus white.

In moist soil, western Ontario to the Northwest Territory and British Columbia, south to Michigan, Kansas, New Mexico and California. June–Sept.

7. Lactuca villòsa Jacq. Hairy-veined Blue Lettuce. (Fig. 3543.)

L. villosa Jacq. Hort. Schoen. 3: 62. *pl. 367.* 1798.
Sonchus acuminatus Willd. Sp. Pl. 3: 1521. 1804.
Mulgedium acuminatum DC. Prodr. 7: 249. 1838.
L. acuminata A. Gray. Proc. Am. Acad. 19: 73. 1883.

Annual or biennial; stem glabrous, leafy up to the paniculate inflorescence, 2°–6° high. Leaves oblong, ovate or lanceolate, acuminate, acutely dentate or the teeth mucronate-tipped, glabrous above, pubescent with short stiff hairs on the veins beneath, sessile and slightly clasping at the base, or petioled, 4′–6′ long, 1′–2½′ wide, the lowest sometimes lobed at the base; heads numerous, 3″–5″ broad; peduncles usually minutely scaly; rays blue; involucre about 5″ high, its outer bracts much shorter than the inner, some or all of them obtuse; achenes thick, oblong, little flattened, narrowed above; pappus white.

In thickets, New York to Illinois, south to Florida, Georgia and Kentucky. July–Sept.

8. Lactuca Floridàna (L.) Gaertn. False or Florida Lettuce. (Fig. 3544.)

Sonchus Floridanus L. Sp. Pl. 794. 1753.
Lactuca Floridana Gaertn. Fruct. & Sem. 2: 362. 1791.
Mulgedium Floridanum DC. Prodr. 7: 349. 1791.

Annual or biennial; stem glabrous, rather stout, leafy up to the large, paniculate inflorescence, 3°–7° high. Leaves deeply lyrate-pinnatifid, sessile or petioled, 4′–12′ long, glabrous above, pubescent on the veins beneath, the terminal segment usually broad, triangular, acute or acuminate, the lateral ones lanceolate to oval, acute, all usually dentate, or the leaves irregularly lobed; heads numerous, 3″–5″ broad; peduncles commonly scaly; rays blue; involucre about 6″ high, its outer bracts much smaller than the inner; achenes thick, somewhat compressed, narrowed above into short necks; pappus white.

In moist, open places, southern New York and Pennsylvania to Illinois and Nebraska (according to Webber), south to Florida and Louisiana. July–Sept.

9. Lactuca spicàta (Lam.) Hitchc. Tall Blue Lettuce. (Fig. 3545.)

Sonchus spicatus Lam. Encycl. 3: 401. 1789.
Mulgedium leucophaeum DC. Prodr. 7: 250. 1838.
Lactuca leucophaea A. Gray, Proc. Am. Acad. 19: 73. 1883. Not Sibth. 1840.

Annual or biennial; stem usually stout, glabrous, 3°–12° high, leafy up to the large, rather dense panicle. Leaves deeply pinnatifid or lobed, sharply dentate with mucronate-pointed teeth, sessile, or the lower narrowed into margined petioles, glabrous on both sides, or pubescent on the veins beneath, 5′–12′ long, 2′–6′ wide; heads very numerous, about 2″ broad; peduncles minutely scaly; rays blue; achenes oblong, compressed, narrowed above into a short neck; pappus brown.

In moist soil, Newfoundland to Manitoba, south to North Carolina, Tennessee and Iowa. Ascends to 2000 ft. in North Carolina. July–Oct.

Lactuca spicàta integrifòlia (A. Gray) Britton, Mem. Torr. Club, 5: 350. 1894.
Lactuca leucophaea var. *integrifolia* A. Gray, Syn. Fl. 1: Part 2, 444. 1884.

Leaves oblong, sharply denticulate, undivided, or some of the lower ones pinnatifid. North Carolina to Michigan.

16. LYGODÉSMIA D. Don, Edinb. Phil. Journ. 6: 311. 1829.

Perennial or annual glabrous rigid branching herbs, with linear leaves, or the basal and lower ones sometimes broader and pinnatifid, those of the stem very narrow and entire or reduced to linear scales, and middle-sized 3–12-flowered heads of pink or purple flowers, solitary and erect at the ends of the stem and branches, or sometimes racemose. Involucre cylindric, its principal bracts 5–8, linear, scarious-margined, equal, slightly united at the base, with several very short outer ones. Receptacle flat, naked. Rays truncate and 5-toothed at the apex. Anthers sagittate at the base. Style-branches slender. Achenes linear, smooth or striate. Pappus of copious somewhat unequal simple bristles. [Greek, twig-bundle, from the numerous branches.]

About 6 species, natives of western and southern North America.

Heads solitary at the ends of the branches; leaves linear or subulate. 1. *L. juncea.*
Heads racemose along the branches; leaves elongated-linear. 2. *L. rostrata.*

1. Lygodesmia júncea (Pursh) D. Don. Rush-like Lygodesmia. (Fig. 3546.)

Prenanthes juncea Pursh, Fl. Am. Sept. 498. 1814.
Lygodesmia juncea D. Don, Edinb. Phil. Journ. 6: 311. 1829.

Perennial by a thick woody root; stems stiff, striate, much branched, 8′–18′ high, the branches erect. Lower leaves linear-lanceolate, rigid, entire, acute, or acuminate, ½′–2′ long, ½″–1½″ wide, the upper similar but smaller, or reduced to subulate scales; heads 6″–8″ broad, mostly 5-flowered, solitary at the ends of the branches; involucre 6″–8″ high; achenes narrowly columnar or slightly tapering, truncate at the summit, about 8-nerved or ribbed, 2½″–3½″ long; pappus light brown.

Plains, Minnesota to Montana, Missouri, Nebraska and New Mexico. Often infested by a globose gall 2″–5″ in diameter. June–Aug.

2. Lygodesmia rostràta A. Gray.
Beaked Lygodesmia.
(Fig. 3547.)

L. juncea var. *rostrata* A. Gray, Proc. Phil. Acad. 1863: 69. 1863.
Lygodesmia rostrata A. Gray, Proc. Am. Acad. 9: 217. 1874.

Annual, less rigid; stem striate, leafy, paniculately branched, 1°–3° high. Leaves elongated-linear, acuminate, entire, 3-nerved, the lower 3′–7′ long, 1″–1½″ wide, the uppermost very small and subulate; heads numerous, 7–10-flowered, about ½′ broad, racemose along the branches on scaly short erect peduncles; involucre 5″–7″ high; achenes narrowly fusiform, narrowed or somewhat beaked at the summit, 5–8-ribbed or -striate, 4″–5″ long, longer than the whitish pappus.

Western Nebraska (according to Webber) to the Northwest Territory, Colorado and Wyoming. Aug.–Sept.

17. AGÓSERIS Raf. Fl. Ludov. 58. 1817.

[Troximon Nutt. Fras. Cat. 1813. Not Gaertn. 1791.]

Perennial or annual herbs, mostly acaulescent, with tufted usually sessile basal leaves, and solitary heads of yellow or rarely purple flowers at the end of a naked or bracted scape. Involucre campanulate or oblong, its bracts imbricated in several rows, appressed, or with spreading tips, membranous or herbaceous, not thickened after flowering, the outer ones gradually shorter and broader. Receptacle flat, naked or foveolate. Rays truncate and 5-toothed at the apex. Anthers sagittate at the base. Style-branches slender. Achenes oblong, obovate, or linear, 10-ribbed, not flattened, beaked at the summit. Pappus of copious slender simple white bristles. [Greek, head- or chief-succory.]

About 25 species, natives of western and southern North America and southern South America. Besides the following, some 20 others occur in the western parts of the United States.

Head 1′–2′ broad, achenes 5″–6″ long. 1. *A. glauca.*
Head 1′ broad or less; achenes about 3″ long. 2. *A. parviflora.*

1. Agoseris glàuca (Pursh) Greene.
Large-flowered Agoseris.
(Fig. 3548.)

T. glaucum Pursh, Fl. Am. Sept. 505. 1814.
Agoseris glauca Greene, Pittonia, 2: 176. 1891.

Perennial, pale or glaucous, glabrous throughout or a little woolly below. Leaves linear, lanceolate, or oblong, entire, dentate or pinnatifid, 2′–10′ long, 2″–10″ wide, acuminate at the apex, narrowed at the base, sometimes into margined petioles; scapes stout, glabrous or slightly pubescent, longer than the leaves, often 1½° high; head 1′–2′ broad; involucre oblong-campanulate, or broader in fruit, commonly quite glabrous, its bracts lanceolate, acuminate, often hyaline-margined; achenes conspicuously beaked, 5″–6″ long, when mature longer than the copious pappus of rather rigid scabrous or denticulate bristles.

South Dakota to the Northwest Territory, south to Kansas (according to Smyth), Colorado and Utah. May–July.

2. Agoseris parviflòra (Nutt.) Greene. Small-flowered Agoseris. (Fig. 3549.)

Troximon parviflorum Nutt. Trans. Am. Phil. Soc. 7: 434. 1841.
Troximon glaucum var. *parviflorum* A. Gray, Syn. Fl. 1: Part 2, 437. 1884.
Agoseris parviflora Greene, Pittonia, 2: 176. 1891.

Perennial, glabrous throughout; scape slender, much longer than the leaves, 5′–15′ high. Leaves narrowly linear, acuminate, entire, 3′–8′ long, 1″–2½″ wide; head 1′ broad or less; involucre oblong-ovoid, becoming nearly hemispheric in fruit, 6″–8″ high, glabrous, its bracts lanceolate, acuminate; achenes conspicuously beaked, about 4″ long; pappus of numerous unequal very slender bristles.

Plains, western Nebraska to Manitoba, Idaho and New Mexico. Called also False Dandelion. May–July.

18. NOTHOCALAIS Greene, Bull. Cal. Acad. (II) 2: 54. 1886.

Perennial herbs, with basal tufted narrow undulate or crisped, tomentose-margined leaves, and large heads of yellow flowers solitary at the ends of simple naked scapes. Involucre oblong-campanulate, its bracts in 2–4 series, lanceolate, acute, or acuminate, appressed, nearly equal, the margins hyaline. Receptacle flat, alveolate. Rays truncate and 5-toothed at the apex. Anthers sagittate at the base. Achenes fusiform, contracted or beaked at the summit, 10-ribbed or 10-striate. Pappus of 10–30 white soft unequal narrow scabrous scales, with or without some capillary bristles. [Greek, false Calais.]

Three known species, natives of western and central North America.

1. Nothocalais cuspidàta (Pursh) Greene. False Calais. (Fig. 3550.)

Troximon cuspidatum Pursh, Fl. Am. Sept. 742. 1814.
Troximon marginatum Nutt. Gen. 2: 128. 1818.
Nothocalais cuspidata Greene, Bull. Cal. Acad. (II) 2: 55. 1886.

Leaves linear, long-acuminate, thick, pubescent or glabrate, 4′–8′ long, 2″–5″ wide, somewhat conduplicate, their margins conspicuously white-tomentose and crisped, or entire. Scape stout, tomentose, at least above, shorter than or equalling the leaves; head 1′–2′ broad; involucre usually quite glabrous, nearly 1′ high; achenes slightly contracted at the summit; about 3″ long; pappus of 40–50 unequal scales and bristles.

In dry soil, on prairies and rocky hills, Illinois to the Northwest Territory, south to Nebraska and Kansas. Called also False Dandelion. April–June.

19. SITILIAS Raf. New Fl. N. A. 4: 85. 1836.

[Pyrrhopappus DC. Prodr. 7: 144. 1838.]

Perennial herbs (some species annual?), with alternate or basal leaves, and mostly large, solitary or few heads of yellow flowers, borne on long, usually bracted peduncles. Involucre oblong or campanulate, its principal bracts in 1 series, nearly equal, slightly united at the base, with several series of smaller outer ones. Rays truncate and 5-toothed at the summit. Anthers sagittate at the base. Style-branches short, obtusish. Achenes oblong or fusiform, mostly 5-ribbed, roughened or hirsute, abruptly narrowed into a long filiform beak. Pappus of numerous soft simple brownish somewhat unequal bristles, surrounded at the base by a villous white ring. [Name unexplained.]

Six known species, natives of North America and Mexico. Besides the following, 2 others occur in the southwestern United States.

Stem leafy, usually branched; plant glabrous, or nearly so. 1. *S. Caroliniana.*
Scape naked, monoecephalous; plant hirsute, or pubescent. 2. *S. grandiflora.*

1. Sitilias Caroliniàna (Walt.) Raf. Leafy Stemmed False Dandelion. (Fig. 3551.)

Leontodon Carolinianum Walt. Fl. Car. 192. 1788.
S. Caroliniana Raf. New Fl. N. A. Part 4, 85. 1836.
Pyrrhopappus Carolinianus DC. Prodr. 7: 144. 1838.

Glabrous or nearly so; stem leafy, usually branched, 2°–5° high. Basal leaves oblong or oblong-lanceolate, pinnatifid, lobed, coarsely dentate or some of them entire, acute, acuminate, or obtusish, 3′–8′ long, ½′–1½′ wide, narrowed into margined petioles; stem leaves sessile or partly clasping, the upper usually lanceolate, entire and acuminate; peduncles usually puberulent; heads 1 or several, 1′–1½′ broad; involucre commonly puberulent or pubescent, about 1′ high, its outer bracts setaceous or subulate, spreading, the inner corniculate at the apex; achenes 2″–3″ long, tipped with a filiform beak of about three times their length.

In dry fields, Delaware to Florida, Missouri, Louisiana and Texas. April-July.

2. Sitilias grandiflòra (Nutt.) Greene. Rough False Dandelion. (Fig. 3552.)

Barkhausia grandiflora Nutt. Journ. Phila. Acad. 7: 69. 1834.
Pyrrhopappus scaposus DC. Prodr. 7: 141. 1838.
Sitilias grandiflora Greene, Pittonia, 2: 180. 1891.

Hirsute or pubescent. Root tuberous-thickened; leaves all basal, oblong or spatulate in outline, deeply pinnatifid, 3′–7′ long, 1′–1½′ wide, narrowed into margined petioles; scape naked or sometimes with a small leaf near its base; head solitary, 1′–2′ broad; outer bracts of the involucre small, short, subulate, the inner ones obscurely corniculate at the tip.

On prairies, Kansas to Texas. April-June.

20. CRÈPIS L. Sp. Pl. 805. 1753.

Perennial or annual herbs, with alternate or basal, mostly toothed or pinnatifid leaves, and small or middle-sized heads, usually paniculate or corymbose, of yellow or orange flowers. Involucre cylindric, campanulate or swollen at the base, its principal bracts in 1 series, equal, with a number of exterior smaller ones. Receptacle mostly flat, naked or short-fimbrillate. Rays truncate and 5-toothed at the apex. Anthers sagittate at the base. Style-branches slender. Achenes linear-oblong, 10–20-ribbed or nerved, not transversely rugose, narrowed at the base and apex, beakless in our species. Pappus copious, of very slender white bristles. [Greek, sandal; application not explained.]

About 180 species, natives of the northern hemisphere. Besides the following, about 10 others occur in western North America.

Involucre glabrous
  Involucre cylindric; plant pubescent below; introduced. 1. *C. pulchra.*
  Involucre campanulate; plant glaucous; native, western. 2. *C. glauca.*
Involucre pubescent, glandular, or canescent.
  Foliage not canescent nor scurfy, sometimes hirsute.
    Stem naked, or with 1 or 2 small leaves; western, native. 3. *C. runcinata.*
    Stems leafy; introduced annuals or biennials.
      Stem leaves narrow, revolute-margined, sessile. 4. *C. tectorum.*
      Stem leaves lanceolate, clasping, not revolute-margined.
        Involucre 3″–4″ high; achenes 10-striate. 5. *C. virens.*
        Involucre 4″–6″ high; achenes 13 striate. 6. *C. biennis.*
  Foliage cinereous, canescent, or scurfy, sometimes also hirsute.
    Inner bracts of the involucre 5-8; flowers 5-8. 7. *C. intermedia.*
    Inner bracts of the involucre 9-21; flowers 10-30. 8. *C. occidentalis.*

1. Crepis púlchra L. Small-flowered Hawksbeard. (Fig. 3553.)

Crepis pulchra L. Sp. Pl. 806. 1753.

Annual; stem 2°–4½° high, leafy and pubescent below, mostly glabrous, naked and paniculately branched above. Stem leaves oblong or oblong-lanceolate, dentate, clasping by an auricled base or truncate, pubescent, 3′–4′ long, acute or obtuse, or the uppermost lanceolate, acuminate and entire; basal leaves runcinate, narrowed into petioles; heads very numerous, about 3″ broad, in a large naked panicle; involucre narrow, cylindric, glabrous, about 5″ high, its principal bracts 12–15, linear, acuminate, the outer ones very short, ovate, appressed; achenes linear, faintly 10-nerved, slightly narrowed above.

Along railroad near Culpepper, Virginia, very abundant in 1890. Naturalized or adventive from Continental Europe. May–July.

2. Crepis glàuca (Nutt.) T. & G. Glaucous Hawksbeard. (Fig. 3554.)

Crepidium glaucum Nutt. Trans. Am. Phil. Soc. (II) 7: 436. 1841.

Crepis glauca T. & G. Fl. N. A. 2: 488. 1843.

Perennial; scapose, or rarely with 1 or 2 leaves on the stem, 1°–2½° high, glabrous and glaucous throughout. Basal leaves spatulate, oblanceolate, or obovate, acute or obtuse at the apex, gradually narrowed into margined petioles, entire, dentate, or pinnatifid, 2′–6′ long, ½′–1′ wide; heads not numerous, long-peduncled, 6″–12″ broad; peduncles glabrous; involucre campanulate, its principal bracts lanceolate, acute, the outer ones very short, ovate, appressed; achenes oblong-cylindric, slightly narrowed above, strongly 10-ribbed.

In moist and saline soil, Nebraska to the Northwest Territory, Nevada and Utah. July–Aug.

3. Crepis runcinàta (James) T. & G. Naked Stemmed Hawksbeard. (Fig. 3555.)

Hieracium runcinatum James in Long's Exp. 1: 453. 1823.

Crepis runcinata T. & G. Fl. N. A. 2: 487. 1843.

Perennial, similar to the preceding species but not glaucous or scarcely so, often pubescent below; stem leafless or with 1 or 2 small leaves, 1°–3° high. Basal leaves spatulate, obovate, or oblong, obtuse or acute, entire, repand, dentate, or rarely runcinate-pinnatifid, 2′–6′ long, ½′–1½′ wide; heads several, long-peduncled, nearly 1′ broad; peduncles glabrous or glandular-pubescent; involucre campanulate, pubescent or glandular, its principal bracts linear-lanceolate, acute, outer ones short, lanceolate, appressed; achenes linear-oblong, somewhat narrowed above, 10-ribbed.

In moist soil, Iowa to Manitoba, west to Utah and Montana. June–July.

4. Crepis tectòrum L. Narrow-leaved Hawksbeard. (Fig. 3556.)

Crepis tectorum L. Sp. Pl. 807. 1753.

Annual; stem slender, puberulent or pubescent, leafy, branched, 1°–2° high. Basal leaves lanceolate, dentate, or runcinate-pinnatifid, 4′–6′ long; stem leaves sessile, sometimes slightly sagittate at the base, linear, entire, dentate, or lobed, their margins revolute; heads numerous, corymbose, 6″–10″ broad; involucre narrowly campanulate, canescent or pubescent, 3″–5″ high, its principal bracts lanceolate, acuminate, downy within, the exterior ones linear, spreading; peduncles usually canescent; achenes 10-ribbed, narrowed above into a short beak, the ribs minutely scabrous.

In waste places and on ballast, New York and New Jersey to Michigan and Nebraska. June-July.

5. Crepis vìrens L. Smooth Hawksbeard. (Fig. 3557.)

Crepis virens L. Sp. Pl. Ed. 2, 1134. 1763.
Crepis polymorpha Wallr. Sched. Crit. 426. 1822.

Anuual; stem stout or sleuder, leafy, corymbosely branched above, glabrous or somewhat hirsute below, 1°–2½° high. Basal leaves spatulate, pinnatifid, or dentate, sometimes 8′ long and 2′ wide, uarrowed into petioles; stem leaves lanceolate or oblong, clasping by a sagittate base, flat, the upper mostly very small and usually entire; heads numerous, 5″–8″ broad, slender-peduncled; peduncles glabrous or glandular; involucre oblong, more or less pubescent or glandular, 3″–4″ high, its principal bracts lauceolate, glabrous within, the outer mostly appressed; achenes 10-ribbed, smooth, slightly narrowed at both ends.

In fields and waste places, southern New York, New Jersey and Pennsylvania, and in ballast about the seaports. Also on the Pacific Coast. Adventive from Europe. Very variable. July–Sept.

6. Crepis biénnis L. Rough Hawksbeard. (Fig. 3558.)

Crepis biennis L. Sp. Pl. 807. 1753.

Biennial, or sometimes annual; stem pubescent or hirsute, leafy, at least below, branched above, 2°–3° high. Leaves runcinate-pinnatifid, usually hirsute, 2′–6′ long, oblong or spatulate, the lower and basal ones narrowed into petioles and sometimes merely dentate, the uppermost lanceolate, clasping, their margins not revolute; heads several, subcorymbose, 1′–1½′ broad; involucre canescent or pubescent, 4″–6″ high, its principal bracts linear-lanceolate, downy within, the outer oues linear-oblong or lanceolate, spreading; achenes oblong, slightly narrowed above, 13-striate, glabrous.

In waste places, Vermont, Pennsylvania, and in ballast about the seaports. Naturalized or adventive from Europe. June–Aug.

7. Crepis intermèdia A. Gray. Small-flowered Gray Hawksbeard. (Fig. 3559.)

Crepis intermedia A. Gray, Syn. Fl. 1: Part 2, 432. 1884.

Perennial, cinereous-puberulent or scurfy; stem rather slender, 1–3-leaved, 1°–2° high, naked and branched above. Basal leaves lanceolate or oblong-lanceolate, laciniate-pinnatifid, long acuminate at the apex, narrowed at the base, 4′–6′ long; stem leaves lanceolate, sessile, less divided; heads several, 6″–9″ broad, 5–8-flowered; involucre oblong-campanulate, its principal bracts 5–8, lanceolate or linear-oblong, canescent, acutish, somewhat keeled by the thickened midrib when old, the outer ones few and short; achenes oblong, narrowed above, not beaked, strongly 10-ribbed.

In dry soil, western Nebraska (according to Williams) and Colorado to California and British Columbia. May–Sept.

8. Crepis occidentàlis Nutt. Large-flowered Gray Hawksbeard. (Fig. 3560.)

Crepis occidentalis Nutt. Journ. Acad. Phil. 7: 29. 1834.

Perennial, scurfy and canescent, sometimes also hirsute; stem rather stout, leafy, branched, 6′–18′ high. Leaves oblong-lanceolate or oblong in outline, laciniate-pinnatifid, acute or acuminate, the lower and basal ones 6′–10′ long, narrowed into petioles, the upper sessile and slightly clasping; heads few or several, corymbose, stout-peduncled, about 1′ broad, 10–30-flowered; involucre oblong-campanulate, canescent, its principal bracts 9–24, linear, acute; achenes oblong, sharply 10-ribbed, glabrous.

Plains, western Nebraska (according to Gray) and Colorado to California, north to the Northwest Territory and British Columbia. May–July.

21. HIERÀCIUM L. Sp. Pl. 799. 1753.

Perennial hispid scabrous glandular or glabrous herbs, with alternate or basal leaves, and small middle sized or large, solitary corymbose or paniculate heads of yellow orange or red flowers. Involucre cylindric, campanulate, or nearly hemispheric, its principal bracts in 1–3 series, the outer either regularly and gradually smaller or abruptly much smaller, none of them much thickened at the base after flowering. Receptacle flat, naked or short-fimbrillate. Rays truncate and 5-toothed at the apex. Anthers sagittate at the base. Style-branches slender. Achenes oblong, columnar, or fusiform, not beaked, 10–15-ribbed, terete or 4–5-angled. Pappus copious, or 1–2 rows of simple rather stiff persistent brown or brownish bristles. [Greek, hawk.]

Not fewer than 300 species, natives of the north temperate zone and the Andes of South America. Besides the following, some 15 others occur in western North America. Known as Hawkweed, Hawk-bit, or Speerhawk.

* Flowering stem leafless, or with 1–5 leaves.

(a) Stem scapose, with a single head only; introduced. 1. *H. Pilosella.*

(b) Heads corymbose or paniculate.

Leaves coarsely dentate; introduced species.

Leaves cordate or subcordate. 2. *H. murorum.*

Leaves narrowed at both ends. 3. *H. vulgatum.*

Leaves denticulate or entire.

Leaves mostly entire, spatulate to oblong; heads corymbose; introduced species.

Heads 8″–12″ broad; flowers red or orange. 4. *H. aurantiacum.*

Heads 5″–9″ broad; flowers yellow.

Glaucous, slightly hispid. 5. *H. praealtum.*

Densely hirsute. 6. *H. pratense.*

Leaves, at least some of them, denticulate, mostly obovate or oval; heads corymbose-paniculate; natives.

Principal bracts of the involucre glabrous, or nearly so.

Stem glabrous, or nearly so; leaves usually purple-veined. 7. *H. venosum.*

Stem pilose below; leaves green. 8. *H. Marianum.*

Involucre and peduncles densely hirsute and glandular. 9 *H. Greenii.*

* * Flowering stem abundantly leafy, at least below.

(a) Principal bracts of the involucre in 2–4 series; heads corymbose.

Leaves sessile, not clasping; involucre glabrous. 10. *H. umbellatum.*

Leaves, at least the upper, clasping; involucre pubescent. 11. *H. Canadense.*

(**b**) Principal bracts in 1 series; heads small, paniculate or racemose.

1. Achenes columnar at maturity, truncate.

Plant nearly or quite glabrous; heads 15–20-flowered. 12. *H. paniculatum.*

Plants scabrous or glandular; heads 15–50-flowered.

Peduncles stout, spreading; no tuft of basal leaves at flowering time. 13. *H. scabrum.*

Peduncles slender, ascending; basal leaves present at flowering time. 8. *H. Marianum.*

2. Achenes spindle-shaped, or with a tapering summit at maturity.

Leaves and lower part of the stem pilose. 14. *H. Gronovii.*

Leaves and stem densely clothed with very long brown hairs. 15. *H. longipilum.*

1. Hieracium Pilosélla L. Mouse-ear Hawkweed. (Fig. 3561.)

Hieracium Pilosella L. Sp. Pl. 800. 1753.

Stoloniferous, pilose-pubescent throughout; stolons leafy, rooting, slender, 3′–12′ long. Scape slender, erect, 4′–10′ high, leafless, with a single head; leaves oblong or spatulate, entire, obtuse or acutish at the apex, narrowed into petioles, often white-tomentose beneath, 1½′–3′ long, 4″–8″ wide; head 1′ broad or more; flowers yellow; principal bracts of the involucre in 1 or 2 series, linear, acuminate, pubescent, usually with 1 or 2 exterior ones; achenes oblong, truncate; pappus a single row of slender bristles.

Dooryards and fields, Ontario, New York, Pennsylvania and Michigan. Adventive from Europe. Called also Ling Gowans, Felon-herb, Mouse Bloodwort. May–Sept.

Hieracium Pilosélla Peleteriànum Mer. Nouv. Fl. Paris, Ed. 2, 230. 1821.

Stolons shorter, thick; plant silky-pubescent. Fields and roadsides, Prince Edward Island. Naturalized from Europe.

2. Hieracium muròrum L. Wall Hawkweed. (Fig. 3562.)

Hieracium murorum L. Sp. Pl. 802. 1753.

Stem pubescent or glabrate, simple, or with 1 or 2 branches, 1°–2½° high. Basal leaves thin, ovate or oblong, obtuse or acute, cordate or truncate at the base, or abruptly narrowed into petioles, coarsely dentate or laciniate, at least near the base, 2′–4′ long, 1′–2′ wide, the petioles villous; stem leaves 1 or 2 (sometimes none), short-petioled or sessile; heads 2–several, corymbose, about 1′ broad; peduncles ascending, usually glandular; involucre 4″–5″ high, its bracts linear-lanceolate, acute, glandular-pubescent, imbricated in 2 or 3 series; achenes columnar, truncate; pappus of slender nearly white bristles.

Woodlands near Brooklyn, N. Y.; about Quebec. Adventive or fugitive from Europe. Called also French or Golden Lungwort. June–Aug.

3. Hieracium vulgàtum Fries. Hawkweed. (Fig. 3563.)

H. molle Pursh, Fl. Am. Sept. 503. 1814. Not Jacq. 1774.
H. vulgatum Fries, Fl. Hall. 128. 1817–18.

Similar to the preceding species, sometimes taller and slightly glaucous; stem 2–5-leaved, pubescent or glabrate. Basal leaves oblong or lanceolate, acute at both ends, or some of them obtuse at the apex, coarsely dentate or denticulate, petioled, 2′–5′ long, ½′–1½′ wide, stem leaves similar, short-petioled or sessile; petioles more or less pubescent; heads several, corymbose, smaller than those of *H. murorum* or as large; peduncles mostly glandular, straight; bracts of the involucre imbricated in 2 or 3 series, linear, acuminate, mostly glandular; achenes columnar, truncate; pappus copious.

Labrador and Newfoundland to Quebec, and in southern New York and New Jersey. Probably introduced. Also in Greenland, northern Europe and Asia. July–Sept.

4. Hieracium aurantiacum L. Orange or Tawny Hawkweed. Golden Mouse-Ear Hawkweed. (Fig. 3564.)

Hieracium aurantiacum L. Sp. Pl. 801. 1753.

Stoloniferous, or stolons wanting; stem leafless or rarely with 1 or 2 small sessile leaves, hirsute, slender, 6′–20′ high. Basal leaves hirsute, tufted, spatulate or oblong, obtuse, narrowed at the base, entire, or sometimes slightly denticulate, 2′–5′ long, ¼′–1′ wide; heads several, short-peduncled, corymbose, 7″–12″ broad; peduncles glandular-pubescent; involucre 4″–5″ high, its bracts linear-lanceolate, acuminate, imbricated in 2 or 3 series, hirsute and sometimes glandular; flowers orange or red; achenes oblong, truncate; pappus a single row of slender brownish bristles.

In fields, woods and along roadsides, New Brunswick and Ontario to New York, New Jersey and Pennsylvania. Naturalized from Europe. Has been thought to be native, but the evidence of this is not satisfactory. Called also Grim the Collier, Devil's Paint-Brush. June–Sept.

5. Hieracium praealtum Vill. King-devil. (Fig. 3565.)

Hieracium praealtum Vill. Fl. Dauph. 3: 100. 1789.

Stoloniferous or stolons wanting; stem glabrous, or somewhat hispid, glaucous, slender, 1½°–3° high, bearing 1–3 leaves near the base. Basal leaves tufted, narrowly oblong, lanceolate, or spatulate, entire, obtuse or acute at the apex, narrowed below into margined petioles, hirsute with stiff hairs, 2′–4′ long, 3″–7″ wide; heads several or numerous, corymbose, 4″–6″ broad; peduncles mostly short, pilose and glandular; involucre about 3″ high, its bracts linear, acute or acuminate, pilose and somewhat glandular, imbricated in about 2 series; flowers yellow; achenes oblong, truncate; pappus a row of slender brownish bristles.

In fields, meadows and along roadsides, in north-central New York; locally a troublesome weed. Naturalized from Europe. June–Sept.

6. Hieracium pratense Tausch. Field Hawkweed. (Fig. 3566.)

H. pratense Tausch, Flora, 11: Part 1, Erg. 56. 1828.

Stoloniferous, hirsute or pilose with long hairs, those of the stem blackish. Stem scapose, simple, 1°–2° high, bearing 1 or 2 leaves below the middle; basal leaves numerous, tufted, light green, oblanceolate to oblong, obtuse, 2′–5′ long, 5″–10″ wide, narrowed into margined petioles, or to a sessile base, entire, or with few distant minute glandular teeth; heads several or numerous, corymbose-paniculate, 10″ wide, or less; flowers yellow; peduncles glandular and often tomentose; bracts of the involucre linear-lanceolate, acuminate, glandular and pilose; achenes columnar, truncate.

Dongan Hills, Staten Island, N. Y. Naturalized or adventive from Europe.

7. Hieracium venòsum L. Rattlesnake-weed. Poor Robin's Plantain. (Fig. 3567.)

Hieracium venosum L. Sp. Pl. 800. 1753.

Stems solitary or several from the same root, slender, glabrous, or with a few hispid hairs near the base, or also above, leafless or with 1–3 leaves, paniculately branched above, 1°–3° high. Basal leaves tufted, spreading on the ground, obovate, oval or oblong-spatulate, mostly obtuse, narrowed at the base, sessile or petioled, 1′–4′ long, ½′–1½′ wide, usually purple-veined, more or less hirsute, some or all of them glandular-denticulate; heads commonly numerous, 5″–8″ broad, 15–40-flowered, slender-pedunculed; peduncles glabrous, or slightly glandular; involucre about 3″ high, its principal bracts in 1 series, glabrous or nearly so, with a few short outer ones; achenes columnar, truncate; pappus brown, not copious.

Dry woods and thickets, Maine to Ontario and Manitoba, south to Georgia, Kentucky and Nebraska. Ascends to 4200 ft. in North Carolina. Called also Early or Vein-leaf Hawkweed, Striped Bloodwort, Snake Plantain and Hawkbit. May–Oct.

8. Hieracium Mariànum Willd. Maryland Hawkweed. (Fig. 3568.)

H. Marianum Willd. Sp. Pl. 3: 1572. 1804.

Stems usually solitary, slender, pilose-pubescent, at least below, paniculately branched above, 2°–3° high, bearing 2–7 leaves. Basal leaves obovate or oblong, ascending or erect, obtuse, narrowed at the base, sessile or petioled, villous or hirsute, glandular-denticulate, 2′–8′ long, 1′–2′ wide, not purple-veined, those of the stem similar, smaller; heads commonly numerous, corymbose-paniculate, 6″–10″ broad, 15–40-flowered, slender-pedunculed; peduncles more or less glandular and sometimes canescent; involucre about 4″ high, its principal bracts in 1 series, linear-lanceolate, acute, or acuminate, glabrous or nearly so, with a few short outer ones; achenes columnar, truncate; pappus brown, not copious.

In dry woods and thickets, Rhode Island to southern New York, Pennsylvania, Kentucky, Alabama and Florida. May–July.

9. Hieracium Greènii Porter and Britton. Green's Hawkweed. (Fig. 3569.)

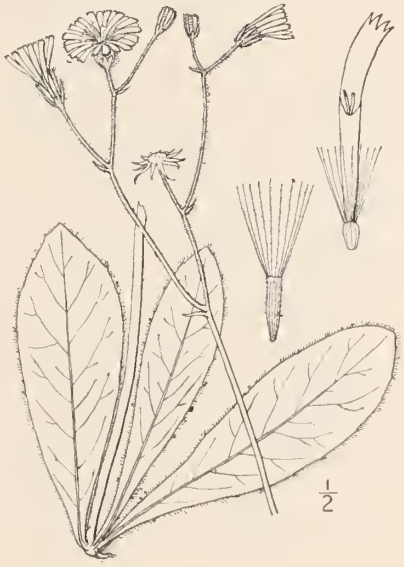
Pilosella spathulata Sch. Bip. Flora, 45: 439. 1862. Not *Hieracium spathulatum* Scheele, 1863.

Hieracium Marianum var. *spathulatum* A. Gray, Syn. Fl. 1· Part 2, 446. 1886.

H. Greenii Porter and Britton, Bull. Torr. Club, 20: 120. 1893.

Stem entirely glabrous up to the branches, rather slender, leafless or rarely with 1 or 2 leaves. 1½°–2½° high. Basal leaves tufted, ascending, spatulate, oblong, or obovate, obtuse, narrowed at the base, mostly petioled, glandular-denticulate or entire, villous-pubescent or somewhat hispid, 4′–7′ long, ½′–2′ wide; heads corymbose-paniculate, several or numerous, 30–40-flowered, slender-pedunculed, 8″–10″ broad; peduncles and branches canescent-tomentose and glandular; involucre 5″ high, its principal bracts in 1 series, linear, acute, densely pilose-glandular; flowers bright yellow; achenes columnar, truncate; pappus brownish, not copious.

In dry soil, mountains of Pennsylvania to Virginia and West Virginia. May–June.



10. Hieracium umbellàtum L. Narrow-leaved Hawkweed. (Fig. 3570.)

Hieracium umbellatum L. Sp. Pl. 804. 1753.

Stem rather slender, glabrous or puberulent, sometimes hispid below, usually very leafy nearly or quite up to the inflorescence, usually simple, 1°–2½° high. Leaves lanceolate or linear-lanceolate or the lowest spatulate, entire, denticulate or sometimes laciniate-dentate, acute or acuminate, narrowed to a sessile base, 1′–3′ long, 2″–6″ wide, glabrous above, mostly somewhat pubescent beneath, the margins commouly ciliolate; no tuft of basal leaves at flowering time; heads few or several, corymbose, about 1′ broad; peduncles rather stout, canescent; involucres 5″–7″ high, glabrous or nearly so, its bracts imbricated in 2–3 series, the outer spreading; flowers bright yellow; achenes columuar, truncate; pappus copious, brownish.

Lower St. Lawrence River to Ontario, Minnesota, Nebraska, British Columbia and Oregon. Also in northern Europe and Asia. June–Aug.

11. Hieracium Canadénse Michx. Canada Hawkweed. (Fig. 3571.)

H. Canadense Michx. Fl. Bor. Am. 2: 86. 1803.

Stem erect, firm, glabrate or pubescent, leafy, 1°–5° high. Leaves numerous, oblong-lanceolate ovate-obloug, or lanceolate, acute or acuminate at the apex, rounded, sessile, aud, at least the upper ones, clasping at the base, 1′–3′ long, 3″–12″ wide, serrate or iucised, the margins sometimes ciliolate, glabrous or pubescent beneath, the lowest somewhat spatulate and petioled; uo tuft of basal leaves at flowering time; heads usually numerous, corymbose-paniculate, about 1′ broad; involucre about 6″ high, pubescent or puberulent, its bracts imbricated in 2–3 series, the outer spreading; flowers yellow; achenes columnar, truncate; pappus copious, browu.

In dry woods and thickets, Nova Scotia to Ontario and the Northwest Territory, south to New Jersey and Michigan. July-Sept.

12. Hieracium paniculàtum L. Panicled Hawkweed. (Fig. 3572.)

Hieracium paniculatum L. Sp. Pl. 802. 1753.

Glabrous throughout, or somewhat pilose-pubescent below, stem paniculately branched above, leafy, slender, 1°–3° high. Leaves thin, lanceolate or oblong-lanceolate, acute or acuminate at the apex, narrowed to a sessile base, or the lowest into petioles, denticulate or dentate, 2′–6′ long, 3″–12″ wide; no tuft of basal leaves at floweriug time; heads 5″–7″ broad, commonly numerous, corymbose-paniculate, 12–20-flowered, peduncles slender, often drooping; peduncles quite glabrous or sometimes glandular; involucre about 3″ high, glabrous or nearly so, its principal bracts in 1 series, liuear, acute with a few very small outer ones at the base; flowers yellow; achenes columnar, truncate; pappus brown, not very copious.

In dry woods, Maine, Quebec and Ontario to Georgia, Alabama and Kentucky. Ascends to 4600 ft. in Virginia. July-Sept.

13. Hieracium scàbrum Michx. Rough Hawkweed. (Fig. 3573.)

Hieracium scabrum Michx. Fl. Bor. Am. 2: 86. 1803.

Stem stout, leafy, densely hirsute or hispid below and glandular-pubescent above, strict, 1°–4° high. Leaves hirsute, obovate, oblong, or broadly spatulate, 2′–4′ long, 1′–2′ wide, obtuse at the apex, narrowed to the sessile base or the lowest into margined petioles, denticulate; no tuft of basal leaves at flowering time; heads usually numerous, 6″–8″ broad, racemose-paniculate; peduncles stout, densely glandular; involucre 4″–5″ high, glandular, its principal bracts in 1 series, linear, acute with a few very small outer ones; flowers yellow; achenes columnar, truncate; pappus brown.

In dry woods and clearings, Nova Scotia to Minnesota, Georgia, Nebraska and Kansas. July–Sept.

14. Hieracium Gronòvii L. Gronovius' Hawkweed. Hairy Hawkweed. (Fig. 3574.)

Hieracium Gronovii L. Sp. Pl. 802. 1753.

Stem stiff, mostly slender, leafy and villous or hirsute, at least below, sometimes nearly leafless, 1°–3° high. Leaves villous or hirsute, the basal and lower ones obovate or spatulate, denticulate or entire, obtuse, 2′–6′ long, usually narrowed into petioles; stem leaves mostly sessile, oblong or oval, obtuse or acute, narrowed or broad at the base, the upper gradually smaller; heads numerous, racemose-paniculate, 5″–8″ broad; peduncles glandular and canescent, slender; involucre about 4″ high, somewhat canescent, its principal bracts in 1 series, linear-lanceolate, acute, with several very small outer ones; flowers yellow; achenes spindle-shaped, with a tapering summit; pappus brown.

In dry soil, Massachusetts to Ontario, Illinois, Florida and Louisiana. July–Sept.

15. Hieracium longípilum Torr. Long-bearded Hawkweed. (Fig. 3575.)

H. longipilum Torr.; Hook. Fl. Bor. Am. 1: 298. 1833. *Hieracium barbatum* Nutt. Journ. Phil. Acad. 7: 70. 1834. Not Tausch. 1828.

Stem, at least its lower portion, and leaves densely covered with long brown rather rigid bristly hairs ½′–1′ long, arising from papillae. Stem very leafy below, stiff, simple, 2°–3½° high; basal and lower leaves spatulate or oblong, obtuse, mostly entire, 4′–8′ long, narrowed into margined petioles, the upper lanceolate or spatulate, mostly sessile, the uppermost small and bract-like; heads not very numerous, racemose or racemose-paniculate, 8″–10″ broad; peduncles short, stout, tomentose and glandular; involucre 4″–5″ high, its principal bracts in 1 series, linear-lanceolate, acuminate, with several short subulate outer ones; flowers yellow; achenes fusiform with a slightly tapering summit; pappus brown.

Prairies and dry woods, Ontario to Minnesota, Illinois, Kansas and Texas. July–Sept.

22. NÁBALUS Cass. Dict. Sci. Nat. 34: 94. 1825.

Perennial, herbs with alternate, mostly petioled, dentate lobed or pinnatifid leaves, or the upper auriculate and clasping, and numerous small heads of ligulate white yellowish or purplish flowers in open or spike-like terminal panicles, or also in axillary clusters, usually drooping. Involucre cylindric, usually narrow, its principal bracts in 1 or 2 series, nearly equal, with a few smaller exterior ones at the base. Receptacle flat, naked. Rays truncate and 5-toothed at the summit. Style-branches slender. Achenes oblong or narrowly columnar, truncate, terete or 4–5-angled, mostly 10-ribbed. Pappus of copious rather rigid simple white to reddish-brown bristles. [Modern Latin, from an Indian name for Rattlesnake-root.]

About 20 species, natives of America and Asia. Besides the following, another occurs in northwest America. Known by the general name of Rattlesnake-root or Drop-flower. The European and African genus *Prenanthes* L., is distinct from this.

* Bracts of the involucre glabrous, or with a few scattered hairs.

Heads 5–7-flowered; involucre very narrow, light green, 1″ thick; pappus light straw-color. 1. *N. altissimus.*
Heads 8–16-flowered; involucre broader, green, purple or glaucous, 1½″–3″ thick.
  Leaves, or some of them, lobed, divided, or pinnatifid; involucre about 1½″ thick.
    Pappus deep cinnamon-brown. 2. *N. albus.*
    Pappus straw-color or light brown.
      Inflorescence paniculate.
        Involucral bracts with some stiff hairs, obviously shorter than the pappus; panicle-branches divergent. 3. *N. serpentarius.*
        Involucral bracts glabrous, equalling the pappus; panicle-branches ascending, or upcurved. 4. *N. trifoliolatus.*
      Inflorescence thyrsoid or glomerate.
        Leaves palmately lobed or divided; northern. 5. *N. nanus.*
        Leaves pinnately lobed or pinnatifid; southern. 6. *N. virgatus.*
  Leaves irregularly dentate or denticulate, oblong; plant tall. 3. *N. serpentarius.*
  Leaves entire or denticulate; plant low, alpine; involucre 2½″–3″ thick. 7. *N. Boottii.*

* * Bracts of the involucre hirsute-pubescent.

Inflorescence narrowly thyrsoid; heads 8–16-flowered.
  Leaves and stem rough-puberulent or scabrous. 8. *N. asper.*
  Leaves and stem glabrous, glaucous. 9. *N. racemosus.*
Inflorescence corymbose-paniculate; heads 20–25-flowered. 10. *N. crepidineus.*

1. Nabalus altissimus (L.) Hook. Tall White Lettuce. (Fig. 3576.)

Prenanthes altissima L. Sp. Pl. 797. 1753.

Nabalus altissimus Hook. Fl. Bor. Am. 1: 294. 1833.

Glabrous, or sparingly hispidulous, not glaucous; stem slender, 3°–7° high, green, or sometimes purplish. Leaves thin, hastate, cordate, ovate, or the uppermost lanceolate, entire, denticulate, dentate or palmately lobed or divided, most of them long-petioled, the larger sometimes 6′ long; heads very numerous, in a narrow panicle, and often in axillary clusters, 5–7-flowered, pendulous, about 2″ broad; inflorescence often narrow; involucre narrowly cylindric, 5″–6″ long, about 1″ thick, green, glabrous, its principal bracts about 5; flowers greenish or yellowish white; pappus light straw-color.

In woods and thickets, Newfoundland to Manitoba, south to Georgia and Tennessee. A plant from Missouri has bright brown pappus. Called also Lion's-foot, Rattlesnake-root. Ascends to 2500 ft. in the Catskills. July–Oct.

2. Nabalus álbus (L.) Hook. Rattlesnake-root. White Lettuce. (Fig. 3577.)

Prenanthes alba L. Sp. Pl. 798. 1753.
Nabalus albus Hook. Fl. Bor. Am. 1: 294. 1833.

Glabrous and glaucous; stem commonly purple, 2°–5° high. Leaves hastate, ovate, cordate, denticulate, dentate, lobed, or palmately divided, or the upper lanceolate, entire, thicker than those of the preceding species, the larger sometimes 8′ long; heads numerous, pendulous, 8–15-flowered, about 3″ broad, paniculate, or thyrsoid, and often in axillary clusters; involucre glabrous, or with a few scattered hairs, glaucous, 5″–7″ high, about 1½″ thick, its principal bracts about 8, purplish, with several minute outer ones; flowers greenish or yellowish white, fragrant; pappus dark cinnamon-brown.

In woods, Maine and Ontario to Manitoba, south to Georgia and Kentucky. Called also Lion's-foot and White Cankerweed. Aug–Sept.

3. Nabalus serpentàrius (Pursh) Hook. Lion's-foot. Gall-of-the-Earth. (Fig. 3578.)

Prenanthes serpentaria Pursh, Fl. Am. Sept. 499. *pl. 24.* 1814.
Nabalus serpentarius Hook. Fl. Bor. Am. 1: 294. 1833.
Nabalus Fraseri DC. Prodr. 7: 241. 1838.

Glabrous or sparingly pubescent, green; stem stout or sleuder, not glaucous, 1°–4° high. Leaves rather firm, similar to those of the preceding species, equally variable in outline, often pinnatifid or pinnately lobed, or palmately divided; inflorescence paniculate, the branches divaricate, upcurved; heads numerous, about 3″ broad, 8–12-flowered, pendulous, paniculate, and commonly also in axillary clusters; involucre more or less bristly-hispid, rarely glabrous, green or purplish, about 1½″ thick, 5″–7″ long, its principal bracts about 8, shorter than the pappus, with several minute lanceolate outer ones; flowers whitish or cream-color, rarely yellow; achenes about 3″ long; pappus light brown or straw-color.

In fields and thickets, Ontario to southern New York, Florida, Alabama and Kentucky. Called also Canker-weed, Rattlesnake-root, White Lettuce and Snake Gentian. July–Oct.

Nabalus serpentàrius integrifòlius (Cass.) Britton.

Nabalus integrifolius Cass. Dict. Sci. Nat. 34: 95. 1825.

Leaves oblong to oval, irregularly dentate, denticulate or entire. Long Island to North Carolina.

4. Nabalus trifoliolàtus Cass. Tall Rattlesnake-root. (Fig. 3579.)

Nabalus trifoliolatus Cass. Dict. Sci. Nat. 34: 95. 1825.

Glabrous throughout; stem usually stout, 3°–9° high. Leaves thinnish, the lower long-petioled, usually 3-divided with the divisions stalked or sessile, the upper short-petioled or sessile, all commonly lobed or dentate, but the upper sometimes lanceolate, acuminate and entire; inflorescence paniculate, the panicle-branches ascending, or nearly erect; heads few in the clusters, drooping, 7–12-flowered; involucre pale green or purplish, glabrous, about 1½″ thick and 6″ long, its principal bracts 6-8, equalling the pappus, the short outer ones ovate to lanceolate; flowers whitish or pale yellow; achenes 2″–3″ long; pappus light brown.

In woods and thickets, Maine to Pennsylvania, and probably much more widely distributed. Aug.–Oct.

5. Nabalus nànus (Bigel.) DC. Low Rattlesnake-root, or Lion's-foot. (Fig. 3580.)

Prenanthes alba var. *nana* Bigel. Fl. Bost. Ed. 2, 286. 1824.
Nabalus nanus DC. Prodr. 7: 241. 1838.
Prenanthes serpentaria var. *nana* A. Gray, Syn. Fl. 1: Part 2, 434. 1884.

Glabrous throughout; stem simple, erect, 4′–16′ high. Basal and lower leaves slender-petioled, 3-divided, or sometimes broadly hastate, the divisions variously lobed, toothed, or entire, usually sessile, occasionally stalked; upper leaves much smaller, entire, toothed, or lobed, sessile, or short-petioled; inflorescence thyrsoid, glomerate-spicate or racemose, rarely with 1 or 2 short ascending branches; involucre dark purple-brown or nearly black, glabrous, 4″–6″ long, its inner bracts 6–8, slightly ciliate at the apex, about as long as the usually bright brownish pappus; outer bracts lanceolate to ovate-lanceolate.

Alpine summits of the Adirondacks and the mountains of New England; Nova Scotia to Labrador and Newfoundland. Aug.-Sept.

6. Nabalus virgàtus (Michx.) DC. Slender Rattlesnake-root. (Fig. 3581.)

Prenanthes virgata Michx. Fl. Bor. Am. 2: 84. 1803.
Nabalus virgatus DC. Prodr. 7: 242. 1838.

Glabrous, somewhat glaucous; stem strict, mostly simple, 2°–4° high. Leaves lanceolate or oblong-lanceolate, the basal and lower ones sinuate-pinnatifid or pinnately parted, petioled, often 10′ long, the lobes entire or dentate, distant; upper leaves all sessile, pinnately lobed, or the uppermost entire, very small and bract-like; heads very numerous, pendulous, about 2″ broad, in a narrow, simple or branched, terminal thyrsus, often unilateral; involucre purplish, about 1½″ thick and 5″ long, its principal bracts about 8, with several minute outer ones; flowers white or pinkish; pappus straw-color.

In moist sandy soil, New Jersey to Florida, near the coast. Called also De Witt's Snakeroot. Sept.-Oct.

7. Nabalus Boòttii DC. Boott's Rattlesnake-root. (Fig. 3582.)

Nabalus Boottii DC. Prodr. 7: 241. 1838.
Prenanthes Boottii A. Gray, Syn. Fl. 1: Part 2, 435. 1884.

Glabrous below, commonly pubescent above; stem simple, 4′–12′ high. Leaves thickish, the basal and lower ones ovate, hastate, or deltoid, petioled, mostly obtuse, entire, or denticulate, 1′–2′ long, the upper ovate or oblong, usually entire, short-petioled or sessile, much smaller; heads several or numerous, 10–18-flowered, erect, spreading, or some of them pendulous, racemose or somewhat thyrsoid, 4″–5″ broad; involucre campanulate-oblong, 2½″–3″ thick, 4″–7″ long, dark purplish-green, its principal bracts 8–10, obtuse or obtusish, with several shorter outer ones; flowers whitish, odorous; pappus brownish.

Alpine summits of the mountains of northern New England and New York. July–Aug.

8. Nabalus ásper (Michx.) T. & G. Rough White-lettuce. (Fig. 3583.)

Prenanthes aspera Michx. Fl. Bor. Am. 2: 83. 1803.
Nabalus asper T. & G. Fl. N. A. 2: 483. 1843.

Scabrous or rough-puberulent; stem virgate, simple, 2°–4° high. Leaves firm, oval, oblong, or oblanceolate, those of the stem all closely sessile, acute or acutish, dentate, denticulate, or the uppermost entire, the lower sometimes clasping, 2′–3′ long, ½′–1′ wide, the basal tapering into winged petioles, commonly obtuse; heads very numerous, erect, spreading, or slightly drooping, 3″–4″ broad, 12–16-flowered, in a long narrow thyrsus; involucre oblong, 2″–2½″ thick, 5″–7″ high, very hirsute, its principal bracts 8–10, with several short outer ones; flowers light yellow; pappus straw-color.

On dry prairies, Ohio to Minnesota and Nebraska, south to Kentucky, Louisiana and Kansas. Aug.–Sept.

9. Nabalus racemòsus (Michx.) DC. Glaucous White-lettuce. (Fig. 3584.)

Prenanthes racemosa Michx. Bor. Fl. Am. 2: 83. 1803.
Nabalus racemosus DC. Prodr. 7: 242. 1838.

Stem virgate, rather stout, glabrous and somewhat glaucous; stem striate, 2°–6° high. Leaves thickish, glabrous and glaucous, the lower and basal ones oval, oblong, oblanceolate, or obovate, dentate or denticulate, 4′–8′ long, mostly obtuse, tapering into long margined petioles; upper leaves sessile, smaller and partly clasping, lanceolate to ovate-lanceolate, denticulate or entire, mostly acute; heads very numerous, erect, spreading, or slightly drooping, 1–16-flowered, 2″–3″ broad, in a long narrow thyrsus; involucre oblong-cylindric, hirsute, 5″–6″ long, 1½″–2½″ thick, longer than the hirsute peduncle, its principal bracts 8–10, with several small outer ones; flowers purplish; pappus straw-color.

In moist open places, New Brunswick and Anticosti to the Northwest Territory, south to southern New York, New Jersey, Missouri and Colorado. Aug.–Sept.

Nabalus racemòsus pinnatífidus (A. Gray) Britton.

Prenanthes racemosa var. *pinnatifida* A. Gray, Syn. Fl. 1: Part 2, 433. 1884.

Leaves pinnatifid or pinnately lobed. Hackensack marshes, N. J.; near Mt. Vernon, N. Y.

Prenanthes Mainénsis A. Gray, Syn. Fl. 1: Part 2, 433, from northern Maine, is probably a hybrid between *N. racemosus* and *N. trifoliolatus*.

10. Nabalus crepidíneus (Michx.) DC. Corymbed Rattlesnake-root. (Fig. 3585.)

Prenanthes crepidinea Michx Fl. Bor. Am. 2: 84. 1803.
Nabalus crepidineus DC. Prodr. 7: 242. 1838.

Stem glabrous or very nearly so below, corymbosely branched and sometimes puberulent above, stout, 5°–9° high. Leaves thin, the basal and lower ones hastate, ovate, oblong, or deltoid, sharply dentate, lobed, or incised, sometimes 10′ long, usually with broadly winged petioles; the upper much smaller, sessile or short-petioled, narrowed at the base, not clasping, ovate, deltoid, or lanceolate, acute; heads numerous, pendulous, short-peduncled, corymbose-paniculate, 4″–6″ broad, 20–35-flowered; involucre oblong or oblong-campanulate, hirsute, 5″–8″ long, about 3″ thick, dark green or purplish, its principal bracts 12–15, with several very short outer ones; flowers cream color; pappus brown.

In fields and thickets, western Pennsylvania and New York to Kentucky, west to Minnesota and Kansas. Aug.–Oct.

Family 42. AMBROSIÀCEAE Reichenb. Consp. 112. 1828.

Ragweed Family.

Annual or perennial herbs, monoecious, or sometimes dioecious, many of them weeds, rarely shrubby, with alternate leaves, or the lower opposite, and small heads of greenish or white flowers subtended by an involucre of few, separate or united bracts, the pistillate heads sometimes larger and nut-like or bur-like. Staminate and pistillate flowers in the same heads, or in separate heads. Receptacle chaffy. Pistillate flowers with no corolla, or this reduced to a short tube or ring; calyx adnate to the 1-celled ovary, its limb none, or a mere border; style 2-cleft. Staminate flowers with a funnelform tubular or obconic 4–5-lobed corolla; stamens mostly 5, separate, or their anthers merely connivent, not truly syngenesious, with short inflexed appendages; ovary rudimentary; summit of the style often hairy or penicillate.

Eight genera and about 55 species, mostly natives of America, a few only of the Old World.

Staminate and pistillate flowers in the same heads; involucre of a few rounded bracts. 1. *Iva.*
Staminate and pistillate flowers in separate heads, the staminate mostly uppermost; involucre of the pistillate heads bur-like or nut-like.
Involucral bracts of the staminate heads united.
Involucre of the pistillate heads with several tubercles or prickles in a single series. 2. *Ambrosia.*
Involucre of the pistillate heads with numerous prickles in several series. 3. *Gaertneria.*
Involucral bracts of the staminate heads separate; involucre of pistillate heads an oblong bur. 4. *Xanthium.*

1. ÌVA L. Sp. Pl. 988. 1753.

Puberulent or scabrous herbs, with thick opposite leaves, or the upper alternate, and small nodding, axillary and solitary, spicate racemose or paniculate heads of greenish flowers. Involucre hemispheric or cup-shaped, its bracts few, rounded. Receptacle chaffy, the linear or spatulate chaff enveloping the flowers. Marginal flowers 1–6, pistillate, fertile, their corollas short, tubular or none. Disk-flowers perfect, sterile, their corollas funnelform, 5-lobed, their styles undivided, dilated at the apex. Anthers entire at the base, yellow, scarcely coherent with each other, tipped with mucronate appendages. Achenes compressed, obovoid, glabrous. Pappus none. [Named after *Ajuga Iva*, from its similar smell.]

About 12 species, natives of America. Besides the following, 6 others occur in the southern and western United States.

Heads spicate or racemose, each subtended by a linear or oblong leaf.
Heads solitary, pedicelled.
Bracts of the involucre 4–5; heads 1½″–2″ high.
Leaves serrate, oval or oblong; eastern. 1. *I. frutescens.*
Leaves entire or nearly so, obovate or oblong; western. 2. *I. axillaris.*
Bracts of the involucre 6–9; heads 3″–4″ high; southeastern. 3. *I. imbricata.*
Heads spicate-paniculate; leaves dentate. 4. *I. ciliata.*
Heads spicate-paniculate, not subtended by leaves. 5. *I. xanthiifolia.*

1. Iva frutéscens L. Marsh Elder. High-water Shrub. (Fig. 3586.)

Iva frutescens L. Sp. Pl. 989. 1753.

Perennial, shrubby or herbaceous, somewhat fleshy; stem paniculately branched above, minutely pubescent, or sometimes glabrous below, 3°–12° high. Leaves oval, oblong, or oblong-lanceolate, all the lower ones opposite, short-petioled, 3-nerved, acute or obtusish, serrate, narrowed at the base, the lower 4′–6′ long, 1′–2′ wide, the upper smaller and narrower, passing gradually into those of the racemose inflorescence which are much longer than the short-pedicelled heads; involucre depressed-hemispheric, its bracts about 5, orbicular-obovate, separate; fertile flowers about 5, their corollas tubular.

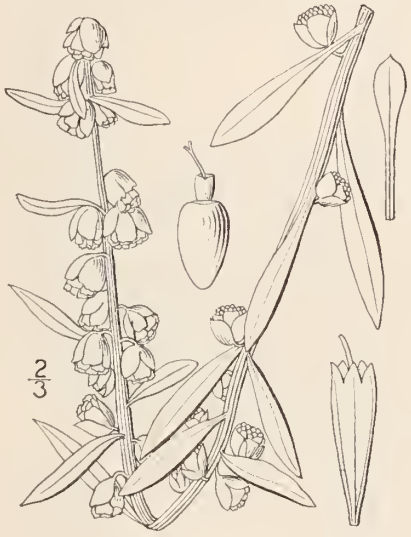
Along salt marshes and on muddy sea-shores, Massachusetts to Florida and Texas, the northern plant mainly broader-leaved and less shrubby than the southern. July–Sept.

2. Iva axillàris Pursh. Small-flowered Marsh Elder. (Fig. 3587.)

Iva axillaris Pursh, Fl. Am. Sept. 743. 1814.

Perennial by woody roots; stems herbaceous, ascending, glabrous or sparingly pubescent, simple or branched, 1°–2° high. Leaves sessile, entire or very nearly so, obtuse, faintly 3-nerved, obovate, oblong, or linear-oblong, ½′–1½′ long, thick, somewhat fleshy, glabrous or pubescent, the lower opposite, the upper alternate and smaller, passing gradually into those of the inflorescence; heads mostly solitary in the axils of the leaves, 2″–3″ broad, short-peduncled; involucre hemispheric, about 1½″ high; its bracts about 5, connate at the base, or united nearly to the summit; pistillate flowers 4 or 5, their corollas tubular.

In saline or alkaline soil, Northwest Territory to western Nebraska, New Mexico, British Columbia and California. May–Sept.



3. Iva imbricàta Walt. Sea-coast Marsh Elder. (Fig. 3588.)

Iva imbricata Walt. Fl. Car. 232. 1788.

Perennial by woody roots, glabrous or nearly so throughout, fleshy; stem 1°–2° high, simple, or sparingly branched. Leaves all but the lowest alternate, sessile, oblong-spatulate, or lanceolate, obtusish, mucronulate, entire, or rarely serrate, obscurely 3-nerved, the larger 1′–2′ long, 3″–5″ wide; heads about 4″ broad, short-peduncled or nearly sessile, the upper ones longer than their subtending leaves; involucre broadly campanulate, its bracts 6–9, not united, somewhat imbricated in 2 series; fertile flowers 2–4, their corollas tubular, the staminate ones much more numerous; chaff of the receptacle spatulate.

On sandy sea-shores, Virginia (according to Gray), and North Carolina to Florida and Louisiana. July–Oct.

4. Iva ciliàta Willd. Rough Marsh Elder. (Fig. 3589.)

Iva annua Michx. Fl. Bor. Am. 2: 184. 1803. Not L.?
Iva ciliata Willd. Sp. Pl. 3: 2386. 1804.

Annual, hispid-pubescent; stem simple, or branched, 2°–6° high. Leaves nearly all opposite, ovate, petioled, scarcely fleshy, puberulent beneath, acuminate at the apex, abruptly or gradually narrowed at the base, coarsely and irregularly dentate, 3-nerved, the lower 4′–5′ long; heads spicate-paniculate, about 1″ broad; spikes dense or interrupted, erect, 2′–8′ long; upper leaves linear-lanceolate, hispid, squarrose, much longer than the heads; bracts of the involucre 3–5, distinct or united below, hispid; fertile flowers 3–5, their corollas slender; staminate flowers 10–15.

In moist soil, Illinois to Nebraska, south to Louisiana and New Mexico. Plant with the aspect of *Ambrosia*. Aug.–Oct.

5. Iva xanthiifòlia (Fresen.) Nutt. Burweed Marsh Elder. (Fig. 3590.)

Cyclachaena xanthiifolia Fresen. Ind. Sem. Hort. Franc. 4. 1836.
Iva xanthiifolia Nutt. Trans. Am. Phil. Soc. (II) 7: 347. 1841.

Annual; stem much branched, pubescent or puberulent above, glabrous below, 3°–6° high. Leaves nearly all opposite, broadly ovate, long-petioled, acuminate at the apex, abruptly or gradually contracted at the base, coarsely and irregularly dentate, pale and canescent or puberulent beneath, roughish above, 3-ribbed, the lower often 6′ long and wide; inflorescence spicate-paniculate, terminal and axillary, ample, naked; heads sessile or minutely peduncled, less than 1″ broad; bracts of the involucre in 2 series of 5, the outer ovate, the inner obovate or truncate, concave, subtending the usually 5 achenes; corollas of the fertile flowers rudimentary or none; staminate flowers 10–15, their corollas obconic.

In moist soil, or sometimes in waste places, Michigan to Northwest Territory, south to Wisconsin, Nebraska, New Mexico and Utah. Plant with the aspect of a *Chenopodium*. July–Sept.

2. AMBRÒSIA L. Sp. Pl. 987. 1753.

Monoecious (rarely dioecious) branching herbs, with alternate or opposite, mostly lobed or divided leaves, and small heads of green flowers, the staminate spicate or racemose, the pistillate solitary or clustered in the upper axils. Involucre of the pistillate heads globose-ovoid or top shaped, closed, 1-flowered, usually armed with 4–8 tubercles or spines; corolla none; stamens none; style-branches filiform; achenes ovoid or obovoid; pappus none. Involucre of the staminate heads mostly hemispheric or saucer-shaped, 5–12-lobed, open, many-flowered; receptacle nearly flat, naked or with filiform chaff; corolla funnelform, 5-toothed; anthers scarcely coherent, mucronate-tipped; style undivided, penicillate at the summit. [The ancient classical name.]

About 12 species, mostly natives of America. Besides the following, some 5 others occur in the southern and western United States.

Sterile heads sessile; a lanceolate hispid lobe on inner border of involucre. 1. *A. bidentata.*
Sterile heads short-pedicelled, involucre depressed-hemispheric.
  Leaves opposite, palmately 3–5-lobed, or undivided; receptacle naked. 2. *A. trifida.*
  Leaves opposite and alternate, 1–2-pinnatifid; receptacle chaffy.
    Annual; leaves thin; fruiting involucre spiny. 3. *A. artemisiaefolia.*
    Perennial; leaves thick; fruiting involucre naked or tubercled. 4. *A. psilostachya.*

1. Ambrosia bidentàta Michx. Lance-leaved Ragweed. (Fig. 3591.)

Ambrosia bidentata Michx. Fl. Bor. Am. 2: 182. 1803.

Annual, hirsute, usually much branched, very leafy, 1°–3° high. Leaves lanceolate, mainly alternate, sessile and somewhat cordate-clasping at the base, acuminate at the apex, 1-nerved, 1′–3′ long, 2″–4″ wide, usually with 1 or 2 sharp lobes at the base and a few minute sharp teeth above, or the upper ones quite entire, rough and hirsute or ciliate; spikes of staminate heads dense, 3′–7′ long, their involucres turbinate, bearing a long lanceolate hispid reflexed lobe appearing like a bract on the inner border, their receptacles chaffy; fertile heads solitary, or clustered, oblong, 4-angled, 3″–4″ long, bearing 4 sharp spines.

Prairies, Illinois to Missouri, south to Louisiana and Texas. July–Sept.

2. Ambrosia trífida L. Horse-cane. Bitter-weed. Great Ragweed. (Fig. 3592.)

Ambrosia trifida L. Sp. Pl. 987. 1753.

Annual, scabrous or hispid, or nearly glabrous, branched, 3°–17° high. Leaves all opposite, petioled, 3-nerved, deeply 3–5-lobed, the lobes lanceolate or ovate, sharply serrate, acute or acuminate; lower leaves often 1° wide, the upper sometimes ovate and undivided; racemes of sterile heads 3′–10′ long, their involucres saucer-shaped, 3-ribbed on the outer side, crenate-margined or truncate, their receptacles naked; fertile heads usually clustered in the axils of the upper bract-like leaves, turbinate to obovoid, 5–7-ribbed, conic-beaked, 3″–4″ long, each rib bearing a tubercle near the summit.

In moist soil, Quebec to Florida, west to the Northwest Territory, Nebraska, Colorado and Arkansas. Also called Tall Ambrosia, Richweed, Wild Hemp. July–Oct.

Ambrosia trífida integrifòlia (Muhl.) T. & G. Fl. N. A. 2: 290. 1841.

A. integrifolia Muhl.; Willd. Sp. Pl. 4: 375. 1805.

Leaves ovate or oblong-lanceolate, not lobed; plant usually lower. Frequent with the type.

3. Ambrosia artemisiaefòlia L. Ragweed. Roman Wormwood. Hogweed. Wild Tansy. (Fig. 3593.)

Ambrosia artemisiaefolia L. Sp. Pl. 987. 1753.

Annual, pubescent, puberulent or hirsute, paniculately branched, 1°–6° high. Leaves thin, 1–2-pinnatifid, petioled, 2′–4′ long, the upper alternate, the lower mostly opposite, pale or canescent beneath, the lobes oblong or lanceolate, obtuse or acute; uppermost leaves of the branches sometimes linear-lanceolate and entire; racemes of sterile heads very numerous, 1′–6′ long, the involucres hemispheric, crenate, the receptacle chaffy; fertile heads obovoid or subglobose, mostly clustered, 1½″–2″ long, short-beaked, 4–6-spined near the summit, sparingly pubescent.

In dry soil, often a pernicious weed in cultivated fields, Nova Scotia to Florida, west to British Columbia and Mexico. Also in the West Indies and South America, and introduced into Europe as a weed. Also called Bitterweed, Stickweed, Stammerwort, Carrot-weed. July–Oct.

4. Ambrosia psilostàchya DC. Western Ragweed. (Fig. 3594.)

Ambrosia psilostachya DC. Prodr. 5: 526. 1836.

Similar to the preceding species, but perennial, the leaves thick, the pubescence strigose or hispid. Stems usually much branched, 2°–6° high, rather stout; leaves 1–2 pinnatifid, 2′–5′ long, the lobes acutish; racemes of sterile heads several or numerous, 2′–6′ long, the involucres campanulate, the receptacles chaffy; fertile heads mostly solitary, ovoid or obovoid, reticulated, short-pointed, unarmed, or with about 4 short tubercles, pubescent, 1½″–2″ long.

In moist open soil, Illinois to the Northwest Territory, south to Texas, Mexico and California. July–Oct.

3. GAERTNÈRIA Med. Act. Pal. 3: 244. 1785.

[Franseria Cav. Icon. 2: 78. *pl. 200.* 1793.]

Hispid or tomentose branching herbs, with the aspect of *Ambrosias*, sometimes woody at the base, with mostly alternate lobed or divided leaves, and small monoecious greenish heads of discoid flowers, the staminate in terminal spikes or racemes, the pistillate solitary or clustered in the upper axils. Involucre of the pistillate heads ovoid or globose, closed, 1–4-celled, 1–4-beaked, armed with several rows of spines and forming a bur in fruit; corolla none or rudimentary; style deeply bifid, its branches exserted; stamens none; achenes obovoid, thick, solitary in the cells; pappus none. Staminate heads sessile, or short-peduncled, their involucres broadly hemispheric, open, 5–12-lobed; receptacle chaffy; corolla regular, the tube short, the limb 5-lobed; style undivided; anthers scarcely coherent; mucronate-tipped. [In honor of Joseph Gaertner, 1732–1791, German botanist.]

About 15 species, natives of America. In addition to the following, some 8 others occur in the western and southwestern United States.

Plant hirsute; annual; spines of the fruiting involucre long, flat. 1. *G. acanthicarpa.*
Leaves densely white-tomentose beneath; spines short, conic; perennials.
  Leaves bipinnatifid. 2. *G. discolor.*
  Leaves pinnately divided, the terminal segment large. 3. *G. tomentosa.*

1. Gaertneria acanthicàrpa (Hook.) Britton. Hooker's Gaertneria. (Fig. 3595.)

Ambrosia acanthicarpa Hook. Fl. Bor. Am. 1: 309. 1833.
Franseria Hookeriana Nutt. Trans. Am. Phil. Soc. (II) 7: 345. 1841.
Gaertneria acanthicarpa Britton, Mem. Torr. Club, 5: 332. 1894.

Annual, erect or diffuse, paniculately branched, 1°–2° high; stem hirsute or hispid. Lower and basal leaves slender-petioled, bipinnatifid, 2′–4′ long, the upper short-petioled or sessile, once pinnatifid, or merely lobed; racemes of sterile heads usually numerous, 1′–3′ long; fruiting involucres clustered in the axils, 3″–4″ long, commonly 1-flowered, armed with numerous long flat straight spines.

In moist soil, Northwest Territory to western Nebraska and Texas, west to British Columbia and California. July–Sept.

2. Gaertneria díscolor (Nutt.) Kuntze. White-leaved Gaertneria. (Fig. 3596.)

Franseria discolor Nutt. Trans. Am. Phil. Soc. (II) 7: 345. 1841.
Gaertneria discolor Kuntze, Rev. Gen. Pl. 339. 1891.

Erect or ascending from perennial rootstocks, branched, about 1° high. Leaves nearly all bipinnatifid, petioled, densely white-tomentose beneath, green and pubescent or glabrate above, 2′–5′ long; sterile racemes narrow, commonly solitary, 1′–2′ long; fruiting involucres clustered in the axils, finely canescent, about 2″ long, mostly 2-flowered, armed with short sharp conic spines.

In dry soil, Nebraska to Wyoming, Colorado and New Mexico. Aug.–Sept.

3. Gaertneria tomentòsa (A. Gray) Kuntze. Woolly Gaertneria. (Fig. 3597.)

Franseria tomentosa A. Gray, Mem. Am. Acad. 4: 80. 1849.

Gaertneria tomentosa Kuntze, Rev. Gen. Pl. 339. 1891.

Erect from a deep perennial root, usually branched at the base, 1°–3° high. Leaves pinnately lobed or divided, finely and densely tomentose on both sides, or ashy above, the terminal segment lanceolate or oblong-lanceolate, acuminate, serrulate or entire, very much larger than the 2–6 rather distant narrow lateral ones; sterile racemes solitary, 2′–4′ long; fruiting involucres solitary, or 2–3 together in the upper axils, ovoid, finely canescent or glabrate, 2-flowered, about 3″ long, armed with subulate-conic, very acute, sometimes curved spines.

On rich prairies and along rivers, western Nebraska, Kansas and Colorado. Aug.–Sept.

4. XÁNTHIUM L. Sp. Pl. 987. 1753.

Monoecious annual branching coarse rough or spiny herbs, with alternate lobed or dentate leaves, and rather small heads of greenish discoid flowers, the staminate ones capitate-clustered at the ends of the branches, the pistillate axillary. Staminate heads with a short involucre of 1 to 3 series of distinct bracts; receptacle cylindric, chaffy; corollas tubular, 5-toothed; anthers not coherent, mucronate at the apex; filaments monadelphous; style slender, undivided. Pistillate heads of an ovoid or oblong, closed involucre, covered with hooked spines, 1–2-beaked, 2-celled, each cavity containing one obovoid or oblong achene; corolla none; pappus none; style 2-cleft, its branches exserted. [Greek, yellow, from its yielding a yellow hair-dye.]

About 5 species (more according to some authors), of wide geographic distribution.

Leaves lanceolate, not cordate; axils bearing 3-divided spines. 1. *X. spinosum.*
Leaves orbicular or broadly ovate, cordate, or truncate; axils not spiny.
  Bur 6″–9″ long, usually nearly glabrous; beaks nearly straight; introduced. 2. *X. strumarium.*
  Bur 9″–12″ long, hispid-pubescent; beaks hooked or incurved; native. 3. *X. Canadense.*

1. Xanthium spinòsum L. Spiny or Thorny Clotbur, Clotweed or Burweed. (Fig. 3598.)

Xanthium spinosum L. Sp. Pl. 987. 1753.

Stem pubescent or puberulent, much branched, ascending or erect, 1°–3° high. Leaves lanceolate or ovate-lanceolate, acute or acuminate, lobed, or the upper entire, narrowed at the base, short-petioled, white-canescent beneath and on the whitish veins of the upper surface, 2′–5′ long; axils each with a short-stalked 3-pronged yellow spine nearly 1′ long; ripe fertile involucre (bur) oblong-cylindric, 4″–6″ long, about 2″ in diameter, pubescent, armed with short subulate rather inconspicuous beaks, and numerous glabrous spines about 1″ long.

In waste grounds, Ontario to Florida, west to Illinois, West Virginia, Missouri and Texas. Widely distributed as a weed in western and tropical America. Naturalized from Europe or Asia. Aug.–Nov.

2. Xanthium strumàrium L.
Broad Cocklebur or Burweed.
(Fig. 3599.)

Xanthium strumarium L. Sp. Pl. 987. 1753.

Rough, 1°–6½° high. Leaves slender-petioled, broadly ovate to orbicular, 3-ribbed and cordate or cordate-reniform at the base, the lower often 10′ wide, the margins dentate, or more or less 3–5-lobed, both surfaces roughish and green; bur oblong, glabrous or puberulent, 6″–9″ long, about 3″ in diameter, its 2 sharp conical-subulate 2 toothed beaks straight or nearly so, equalling or slightly longer than the numerous, nearly glabrous or pubescent spines.

In waste places, New England and New York to Nebraska, south to Florida and Mexico. Naturalized from Europe or Asia. Called also Ditch-, Sheep- or Clot-bur, Button Bur, Small or Lesser Burdock, Sea Burdock and Bur-thistle. Aug.–Oct.

3. Xanthium Canadénse Mill.
American Cocklebur. Sea Burdock. Hedgehog Burweed. (Fig. 3600.)

X. Canadense Mill. Gard. Dict. Ed. 8, No. 2. 1768. *Xanthium echinatum* Murr. Comm. Goett. 6: 32. *pl. 4.* 1783.

Similar to the preceding species, usually stouter, the branches ascending or diffuse. Leaves similar and roughish and commonly thicker; stem often brown-spotted; bur oblong, usually densely hispid, 9″–12″ long, 4″–6″ in diameter, the two stout beaks hooked or incurved at the apex, longer than or equalling the more or less hispid stout or slender hooked spines.

Along rivers and sea-beaches and in waste places, Nova Scotia to North Carolina, west to the Northwest Territory, Nevada, Texas and Mexico. Not common in the interior region east of the Mississippi. Aug.–Oct.

Family 43. COMPÓSITAE Adans. Fam. Pl. 2: 103. 1763.

THISTLE FAMILY.

Herbs, rarely shrubs (some tropical forms trees), with watery or resinous (rarely milky) sap, and opposite alternate or basal exstipulate leaves. Flowers perfect, pistillate, or neutral, or sometimes monoecious or dioecious, borne on a common receptacle, forming heads, subtended by an involucre of few to many bracts arranged in one or more series. Receptacle naked, or with chaffy scales subtending the flowers, smooth, or variously pitted or honeycombed. Calyx-tube completely adnate to the ovary, the limb (pappus) of bristles, awns, teeth, scales, or crown-like, or cup-like, or wanting. Corolla tubular, usually 5-lobed or 5-cleft, the lobes valvate, or that of the marginal flowers of the head expanded into a ligule (ray); when the ray-flowers are absent the head is said to be discoid; when present, radiate; the tubular flowers form the disk. Stamens usually 5, borne on the corolla and alternate with its lobes, their anthers united into a tube (syngenesious), often appendaged at the apex, sometimes sagittate or tailed at the base; pollen-grains globose, often rough or prickly. Ovary 1-celled; ovule 1, anatropous; style of fertile flowers 2-cleft, its branches variously appendaged, or unappendaged; stigmas marginal; style of sterile flowers commonly undivided. Fruit an achene. Seed erect; endosperm none; embryo straight; hypocotyl inferior.

About 760 genera and not less than 10,000 species, of wide geographic distribution. The family is also known as CARDUACEAE, AGGREGATAE, and by the English name of *Asterworts*. In *Kuhnia*, the anthers are distinct, or nearly so.

* Anthers not tailed at the base; stigmatic lines of the style-branches only at the base, or not extending beyond the middle; flowers all tubular and perfect, never yellow; rays none.

Style-branches filiform or subulate, hispidulous; receptacle naked. Tribe 1. VERNONIEAE.
Style-branches thickened upward, obtuse, papillose. Tribe 2. EUPATORIEAE.

* * Anthers tailed at the base, unappendaged at the tip; heads small; rays none (except in *Inula* where they are large, yellow). Tribe 4. INULEAE.

* * * Anthers not tailed at the base; stigmatic lines of the style-branches in the perfect flowers extending to the summit; flowers tubular only, or tubular and radiate, often yellow.

1. Receptacle naked (see also Nos. 79, 80, 81 and 82 of Tribe 7.)

a. Bracts of the involucre usually well imbricated.

Style-branches of the perfect flowers flattened, with terminal appendages. Tribe 3. ASTEREAE.
Style-branches truncate, or with hairy tips. Tribe 6. HELENIEAE.

b. Bracts little imbricated, or not at all; pappus of soft bristles. Tribe 8. SENECIONEAE.

2. Receptacle chaffy (except in Nos. 79, 80, 81 and 82).

Bracts of the involucre herbaceous or foliaceous; not scarious. Tribe 5. HELIANTHEAE.
Bracts of the involucre dry, scarious. Tribe 7. ANTHEMIDEAE.

* * * * Anthers long-tailed at the base, with elongated appendages at the tip; heads large; rays none. (in *Centaurea* often with enlarged marginal flowers); bracts imbricated. Tribe 9. CYNAREAE.

Tribe 1. VERNONIEAE.

Pappus double, the inner of rough capillary bristles, the outer of scales, or short bristles; heads not glomerate. 1. *Vernonia.*
Pappus a single series of bristles; heads glomerate, subtended by sessile bracts. 2. *Elephantopus.*

Tribe 2. EUPATORIEAE.

* Achenes 3–5-angled, not ribbed.

Pappus of 5 broad obtuse scales; aquatic herb with linear whorled leaves. 3. *Sclerolepis.*
Pappus of numerous capillary bristles.
Involucre of more than 4 bracts; erect herbs. 4. *Eupatorium.*
Involucre of 4 bracts; twining herbaceous vines. 5. *Willughbaeya.*

* * Achenes 8–10-ribbed, or 8–10-striate.

1. Bracts of the involucre in several series, the outer successively shorter.

Bracts of the involucre strongly striate-nerved; heads panicled or cormybed in our species.
Pappus-bristless rough or serrate; involucral bracts numerous. 6. *Coleosanthus.*
Pappus-bristles plumose; involucral bracts few. 7. *Kuhnia.*
Bracts of the involucre faintly striate, if at all; heads spiked or racemed. 8. *Lacinaria.*

2. Bracts of the involucre in only 2 or 3 series; all nearly equal. 9. *Trilisa.*

Tribe 3. ASTEREAE.

A. Ray-flowers yellow (white in one species of Solidago), or wanting; plants not dioecious.

* Pappus of scales, or awns, or wanting, never of numerous capillary bristles.

Heads small, not over 2″ high; leaves narrowly linear, entire.
Perennial herbs, or shrubs; all the flowers fertile. 10. *Gutierrezia.*
Annual herb; disk-flowers sterile. 11. *Amphiachyris.*
Heads large, showy; leaves oblong to lanceolate, spinulose-dentate. 12. *Grindelia.*

* * Pappus of either the radiate or tubular flowers, or both, of numerous capillary bristles, with or without an outer series of shorter ones, or of scales.

† *Pappus, at least of the disk-flowers, double, an inner series of capillary bristles, and an outer one of scales or short bristles; heads large.*

Achenes of the ray-flowers thick, the pappus obsolete, or of a few caducous bristles; achenes of the disk-flowers flat. 13. *Heterotheca.*
Achenes of both ray-flowers and disk-flowers flattened. 14. *Chrysopsis.*

†† *Pappus wholly of capillary bristles.*

1. Heads wholly of disk-flowers (in our species); rays none; leaves narrowly linear.

a. Perennial herbs; style-tips not exserted; eastern. 15. *Chondrophora.*

b. Shrubs; style-tips mostly exserted; western.

Involucral bracts gradually narrowed to the tip, keeled, chartaceous. 16. *Chrysothamnus.*
Involucral bracts cuspidate, flat, herbaceous. 17. *Oonopsis.*

2. Heads with both ray-flowers and disk-flowers (in our species).

a. None of the leaves cordate; pappus mostly as long as the achene, or longer.

Leaves bristly-serrate or pinnatifid.
Achenes glabrous; pappus-bristles deciduous. 18. *Prionopsis.*
Achenes white-tomentose; pappus-bristles persistent. 19. *Eriocarpum.*
Leaves entire, or toothed, not bristly-serrate.
Leaves narrow, coriaceous, evergreen, entire; low western undershrubs. 20. *Stenotus.*
Annual or perennial herbs; leaves not evergreen.
Pappus-bristles unequal; heads loosely panicled; annual. 21. *Isopappus.*
Pappus-bristles equal; heads variously clustered; perennial herbs.
Receptacle alveolate; rays mostly not more numerous than the disk-flowers. 22. *Solidago.*
Receptacle fimbrillate; rays more numerous than the disk-flowers; heads corymbose-panıculate. 23. *Euthamia.*

b. Lower and basal leaves cordate; pappus-bristles shorter than the achene. 24. *Brachychaela.*

B. Ray-flowers present, not yellow in any of our species.

* Pappus a mere crown, or of a few awns or bristles, or wanting, never of numerous capillary bristles.

1. Receptacle conic.

Outer bracts of the involucre shorter than the inner; achenes prismatic. 25. *Aphanostephus.*
Bracts of the involucre all about equal; achenes flattened. 26. *Bellis.*

2. Receptacle flat, or somewhat convex.

Achenes of the disk-flowers compressed, of the ray-flowers 3-angled; perennial herbs with large heads. 27. *Townsendia.*

Achenes fusiform, terete; annual herbs with small heads. 28. *Chaetopappa.*
Achenes obovate, flattened, with thickened or winged margins; perennials. 29. *Boltonia.*

* * Pappus of numerous capillary bristles.

1. Pappus a single series of capillary bristles; sometimes with an outer series of shorter ones.

a. Bracts of the involucre in 2 to many series.

Bracts mostly in 2–5 series; teeth or lobes of the leaves not bristle tipped.
Involucre narrow, its bracts firm; rays few, white. 30. *Sericocarpus.*
Involucre turbinate to hemispheric, bracts mostly thin; rays usually numerous, white to purple.
Disk-flowers turning red, purple, or brown. 31. *Aster.*
Disk-flowers permanently white; leaves subulate to spatulate, crowded, rigid. 32. *Leucelene.*
Involucre turbinate; rays not exceeding the mature pappus, or none. 33. *Brachyactis.*
Bracts in many series; teeth or lobes of the leaves bristle-tipped in our species. 34. *Machaeranthera.*

b. Bracts of the involucre in only 1 or 2 series, very narrow; heads mostly long-peduncled.

Rays longer than the diameter of the disk. 35. *Erigeron.*
Rays not longer than the diameter of the disk; heads very small, panicled. 36. *Leptilon.*

2. Pappus distinctly double, the inner bristles long, the outer shorter.

Leaves lanceolate, ovate, or obovate; rays white. 37. *Doellingeria.*
Leaves narrowly linear; rays violet. 38. *Ianactis.*

C. Ray-flowers none; dioecious shrubs; pappus capillary. 39. *Baccharis.*

Tribe 4. Inuleae.

* Heads small, rays none; flowers white, or whitish.

1. Receptacle chaffy.

Receptacle convex; pappus none. 40. *Filago.*
Receptacle subulate; pappus of the inner flowers of rough capillary bristles. 41. *Gifola.*

2. Receptacle naked.

a. Pappus, at least that of pistillate flowers, of capillary bristles.

Bracts of the involucre not scarious; plants pubescent or glabrous, not woolly. 42. *Pluchea.*
Bracts of the involucre scarious, mostly white or pink; plants woolly.
Plants dioecious, or polygamo-dioecious.
Pappus-bristles of staminate flowers thickened above. 43. *Antennaria.*
Pappus-bristles not thickened; stem leafy. 44. *Anaphalis.*
Plants not dioecious; flowers all fertile. 45. *Gnaphalium.*

b. Pappus none; leaves broad, alternate, woolly beneath. 46. *Adenocaulon.*

* * Heads large; ray-flowers yellow. 47. *Inula.*

Tribe 5. Helianthеae.

A. Disk-flowers perfect, but sterile.

Achenes thick, short, not flattened; pappus none.
Achenes merely subtended by the inner involucral bracts. 48. *Polymnia.*
Achenes embraced and enclosed by the inner involucral bracts. 49. *Melampodium.*
Achenes flattened.
Ray-flowers in 2 or 3 series; achenes falling away free. 50. *Silphium.*
Ray-flowers in 1 series; achenes adnate to 2 or 3 scales of the receptacle, falling away with them.
Rays large, yellow.
Leaves opposite and basal. 51. *Chrysogonum.*
Leaves alternate.
Pappus none, or of 2 caducous awns. 52. *Berlandiera.*
Pappus a persistent irregularly cleft crown. 53. *Engelmannia*
Rays small, the heads appearing discoid. 54. *Parthenium.*

B. Disk-flowers fertile.

* Ray-flowers persistent upon the achenes.

Acheues compressed, or 3-angled; leaves entire. 55. *Crassina.*
Achenes short, thick; leaves toothed. 56. *Heliopsis.*

* * Ray-flowers deciduous, or none.

† *Pappus a cup, or crown, or of a few teeth, awns, or bristles.*

1. Achenes, at least those of disk-flowers, not compressed (except in *Ratibida* and *Verbesina*); scales of the receptacle mostly concave, or clasping.

Scales of the receptacle small, awn-like or bristles-like; rays white, short. 57. *Eclipta.*
Scales of the receptacle broad, larger.
Involucre of 4 large somewhat united bracts. 58. *Tetragonotheca.*
Involucre of several or numerous separate bracts.
Receptacle conic, or columnar.
Ray-flowers fertile, or wanting; leaves opposite. 59. *Spilanthes.*
Ray-flowers sterile, or neutral; leaves mostly opposite.
Rays yellow.
Achenes 4-angled. 60. *Rudbeckia.*
Achenes compressed, winged. 61. *Ratibida.*
Rays rose-purple. 62. *Brauneria.*
Receptacle flat, or convex (low-conic in species of Nos. 64 and 65.)
Low fleshy sea-coast shrubs. 63. *Borrichia.*
Tall herbs, not fleshy.
Achenes not much flattened, not winged, nor margined. 64. *Helianthus.*
Achenes of disk-flowers flattened and margined, or winged. 65. *Verbesina.*

2. Achenes very flat; scales of the receptacle flat, or but slightly concave.

a. Bracts of the involucre all separate.

Pappus of 2 short teeth or awns, or a mere border, or none. 66. *Coreopsis.*
Pappus of 2–6 awns or teeth, upwardly or downwardly barbed or hispid. 67. *Bidens.*

b. Inner bracts of the involucre united to about the middle. 68. *Thelesperma.*

†† *Pappus of numerous scales.*

Leaves opposite, toothed; ray-flowers fertile; rays small. 69. *Galinsoga.*
Leaves alternate, entire.

Rays large, neutral; receptacle deeply honey-combed. 70. *Actinospermum.*
Rays none; scales of the receptacle narrow, rigid. 71. *Marshallia.*

Tribe 6. HELENIEAE.

A. Ray-flowers persistent on the achenes, falling away with them, papery. 72. *Psilostrophe.*

B. Ray-flowers deciduous, or wanting.

☼ Plants not dotted with oil-glands.

a. Pappus none. 73. *Flaveria.*

b. Pappus present (in all our species), of separate scales or bristles.

1. Bracts of the involucre petal-like, colored, their margins and apices scarious.

Leaves, at least the lower, pinnately parted, or pinnatifid; rays none; corolla-lobes of disk-flowers ovate. 74. *Hymenopappus.*
Leaves entire; rays present, or none; corolla-lobes of disk-flowers linear. 75. *Polypteris.*

2. Bracts of the involucre herbaceous, not scarious-tipped, nor petal-like, appressed, or spreading.

Receptacle naked.
Bracts of the involucre appressed.
Achenes 4-angled, linear or oblong. 76. *Bahia.*
Achenes 5–10-ribbed or 5–10-angled, top-shaped. 77. *Picradenia.*
Bracts of the involucre spreading, or reflexed at maturity. 78. *Helenium.*
Receptacle with bristle-like chaff. 79. *Gaillardia.*

☼ ☼ Plants dotted with oil-glands, especially the leaves and involucre.

Involucral bracts more or less united; style-branches of the disk-flowers elongated.
Involucral bracts united at the base. 80. *Dysodia.*
Involucral bracts united high up into a cup. 81. *Thymophylla.*
Involucral bracts separate; style-branches of the disk-flowers very short. 82. *Pectis.*

Tribe 7. ANTHEMIDEAE.

☼ Receptacle chaffy.

Achenes flattened; involucre obovoid to campanulate; heads small. 83. *Achillea.*
Achenes terete; involucre hemispheric; heads large. 84. *Anthemis.*

☼ ☼ Receptacle not chaffy, naked, or sometimes hairy.

1. Ray-flowers usually present, sometimes wanting; rays large.

Receptacle flat to hemispheric; bracts of the involucre in several series. 85. *Chrysanthemum.*
Receptacle conic to ovoid; bracts in few series; rays white or none. 86. *Matricaria.*

2. Ray flowers none; heads small.

Heads corymbed; pappus a short crown: flowers yellow. 87. *Tanacetum.*
Heads racemose, spicate or panicled; pappus none. 88. *Artemisia.*

Tribe 8. SENECIONEAE.

Leaves all basal; heads on scapes.
Head solitary; flowers yellow. 89. *Tussilago.*
Heads corymbed; flowers white or purple. 90. *Petasites.*
Leaves opposite; rays yellow. 91. *Arnica.*
Leaves alternate.
Flowers white, whitish or pinkish; rays none.
Margiual flowers pistillate; disk-flowers perfect. 92. *Erechtites.*
Flowers all perfect.
Involucre of about 5 bracts; sap milky. 93. *Mesadenia.*
Involucre of about 12 bracts and several smaller outer ones. 94. *Synosma.*
Flowers yellow; ray-flowers mostly present. 95. *Senecio.*

Tribe 9. CYNAREAE.

☼ Achenes inserted on the receptacle by their bases, not oblique.

Receptacle densely bristly.
Filaments separate.
Involucral bracts hooked at the tip; leaves not bristly. 96. *Arctium.*
Involucral bracts not hooked; leaves bristly. 97. *Carduus.*
Filaments united below. 98. *Mariana.*
Receptacle fleshy, not bristly. 99. *Onopordon.*

☼ ☼ Achenes obliquely inserted on the receptacle.

Heads not subtended by bristly leaves; involucral bracts often bristly. 100. *Centaurea.*
Heads sessile, subtended by bristly leaves. 101. *Cnicus.*

1. VERNÒNIA Schreb. Gen. Pl. 2: 541. 1791.

Erect branching perennial herbs, or some tropical species shrubby, with alternate (very rarely opposite), in our species sessile leaves, and discoid cymose-paniculate heads of purple pink or white tubular flowers. Involucre hemispheric, campanulate or oblong-cylindric, its bracts imbricated in several or many series. Receptacle flat, naked. Corolla regular, 5-cleft. Anthers sagittate at the base, not caudate. Style-branches subulate, hispidulous their whole length. Achenes 8–10-ribbed, truncate. Pappus of our species in 2 series, the inner of numerous roughened capillary bristles, the outer of much shorter small scales or stout bristles. [Named after William Vernon, English botanist.]

About 475 species, of wide distribution in warm-temperate regions, most abundant in South America. Besides the following, 2 others occur in the southern and southwestern United States.

Bracts of the hemispheric involucre, or some of them, with subulate or filiform tips.
Involucre 3″–5″ broad, its bracts shorter than the head. 1. *V. Noveboracensis.*
Involucre 9″–12″ broad, its bracts as long as the head. 2. *V. crinita.*
Bracts of the involucre merely acute, obtuse, or truncate.
Leaves lanceolate to oval, pinnately veined.
Bracts of the involucre with squarrose reflexed tips. 3. *V. Baldwinii.*

Bracts of the involucre wholly appressed.
Leaves glabrous or very nearly so on both surfaces.
Leaves thin, pale beneath, the lower oval, coarsely serrate. 4. *V. glauca.*
Leaves thin, green beneath, lanceolate, finely serrate. 5. *V. gigantea.*
Leaves thick, narrowly lanceolate, finely serrate. 6. *V. fasciculata.*
Leaves densely tomentose-pubescent beneath, lanceolate. 7. *V. Drummondii.*
Leaves narrowly linear, 1-nerved, 2″–3″ wide, dentate. 8. *V. marginata.*

1. Vernonia Noveboracénsis (L.) Willd. New York Iron-weed. Flat Top. (Fig. 3601.)

Serratula Noveboracensis L. Sp. Pl. 818. 1753.
V. Noveboracensis Willd. Sp. Pl. 3: 1632. 1804.
C. Noveboracensis Kuntze, Rev. Gen. Pl. 323. 1891.

Roughish pubescent or glabrate, 3°–9° high. Leaves lanceolate or narrowly oblong, serrulate, 3′–10′ long, 5″–12″ wide, acuminate or acute at the apex; heads peduncled; involucre hemispheric, 20–30-flowered, 4″–5″ in diameter; bracts brownish-purple, ovate or ovate-lanceolate, tipped with subulate spreading awns usually of twice or three times their own length, or some of the lower linear subulate, the upper sometimes merely acute; flowers deep purple, rarely white; achenes hispidulous on the ribs.

In moist soil, Massachusetts to Minnesota, south to Georgia and Missouri. July–Sept.

Vernonia Noveboracénsis tomentôsa (Walt.) Britton, Mem. Torr. Club, 5: 311. 1894.
Chrysocoma tomentosa Walt. Fl. Car. 196. 1788.

Leaves densely puberulent beneath, broader; involucre purple, some scales sometimes merely acute. In dry soil, Virginia to North Carolina.

2. Vernonia crinìta Raf. Great Iron-weed. (Fig. 3602.)

V. crinita Raf. New Flora N. A. 4: 77. 1836.
Vernonia Arkansana DC. Prodr. 7: 264. 1838.
C. Arkansana Kuntze, Rev. Gen. Pl. 969. 1891.

Stout, glabrate or finely rough-pubescent, 8°–12° high. Leaves narrowly lanceolate, finely denticulate, acuminate, 4′–12′ long, 3″–12″ wide; heads stout-peduncled, the peduncles thickened above; involucre hemispheric, 9″–12″ broad, 50–70-flowered; bracts green, or the upper reddish, very squarrose, all filiform-subulate from a broader base and equalling the head, the inner ones somewhat wider below; achenes hispidulous on the ribs.

On prairies and along streams, Missouri to Texas. Aug.–Oct.

3. Vernonia Baldwínii Torr. Baldwin's Iron-weed. (Fig. 3603.)

V. Baldwinii Torr. Ann. Lyc. N. Y. 2: 211. 1827.
Cacalia Baldwinii Kuntze, Rev. Gen. Pl. 969. 1891.

Stout, 2°–5½° high, finely and densely tomentose-pubescent. Leaves lanceolate or oblong-lanceolate, acuminate or acute at the apex, sharply serrate, 4′–8′ long, ½′–2′ wide, scabrate above, densely tomentulose beneath; heads stout-peduncled, 15–30-flowered; involucre hemispheric, 3″–4″ broad; bracts ovate, the acute tips recurved or spreading.

In dry soil, Missouri and Nebraska to Texas. July–Sept.

4. Vernonia glàuca (L.) Britton. Broad-leaved Iron-weed. (Fig. 3604.)

Serratula glauca L. Sp. Pl. 818. 1753.
Vernonia Noveboracensis var. *latifolia* A. Gray, Syn. Fl. 1: Part 2, 89. 1884.
Vernonia glauca Britton, Mem. Torr. Club, 5: 311. 1894.

Slender, glabrous or finely puberulent, 2°–5° high. Leaves thin, the lower broadly oval or slightly obovate, sharply serrate, acute or acuminate, 4′–7′ long, 1′–2½′ wide, the upper narrower and more finely toothed; inflorescence loosely branched; heads slender-peduncled, 10–20-flowered; involucre campanulate, 2″–3½″ broad; bracts ovate, acute, or mucronate, or the upper ones obtuse, all appressed; achenes minutely hispidulous.

In woods, Pennsylvania and Maryland to Ohio, south to Florida and Louisiana. Aug.–Sept.

6. Vernonia fasciculàta Michx. Western Iron-weed. (Fig. 3606.)

Vernonia fasciculata Michx. Fl. Bor. Am. 2: 94. 1803.
Cacalia fasciculata Kuntze, Rev. Gen. Pl. 970. 1891.

Glabrous, or puberulent above, 2°–6° high. Leaves firm, lanceolate or linear-lanceolate, long-acuminate, 3′–6′ long, 2″–15″ wide, glabrous or nearly so on both surfaces; inflorescence usually compact; heads short-peduncled, or some of them sessile; involucre campanulate, 2″–3″ broad, 20–30-flowered; bracts all appressed, ovate or oval, acute, ciliate, or sometimes pubescent; achenes glabrous, or a little pubescent.

In moist soil or on prairies, Ohio to Minnesota and Dakota, south to Kentucky and Texas. July–Sept.

5. Vernonia gigantèa (Walt.) Britton. Tall Iron-weed. (Fig. 3605.)

Chrysocoma gigantea Walt. Fl. Car. 196. 1788.
Vernonia altissima Nutt. Gen. 2: 134. 1818.
Cacalia gigantea Kuntze, Rev. Gen. Pl. 324. 1891.
Vernonia gigantea Britton; Kearney, Bull. Torr. Club, 20: 485. 1893.

Glabrous or nearly so, 5°–10° high. Leaves thin, lanceolate, sometimes broadly so, usually long-acuminate, finely serrate, 4′–12′ long, ½′–1½′ wide, usually glabrous on both surfaces; inflorescence at length loosely branched and open; heads short-peduncled or some of them sessile; involucre campanulate or turbinate, 2″–3″ broad, 15–30-flowered; bracts obtuse or mucronate, more or less ciliate, appressed; achenes slightly hispidulous.

In moist soil, Pennsylvania to Florida, west to Illinois, Kentucky and Louisiana. July–Sept.

7. Vernonia Drummóndii Shuttlw. Drummond's Iron-weed. (Fig. 3607.)

Vernonia altissima var. *grandiflora* A. Gray, Syn. Fl. 1: Part 2, 90. 1884. Not *V. grandiflora* Less. 1831.

Vernonia Drummondii Shuttlw.; Werner, Journ. Cinc. Soc. Nat. Hist. 16: 171. 1894.

Stout, densely tomentose, 3°–7° high. Leaves lanceolate to narrowly oblong, acuminate, finely serrate, 3′–6′ long, ½′–1½′ wide, scabrous above, densely pubescent beneath; inflorescence usually compact; heads short-peduncled; involucre hemispheric or short-cylindric, 2″–6″ in diameter, 15–50-flowered; bracts purplish, appressed, ovate, acute, or mucronate, more or less floccose-pubescent or ciliate; achenes glabrous or a little pubescent.

Prairies, Illinois and Kentucky to Missouri and Texas. Autumn.

8. Vernonia marginàta (Torr.) Britton. James' Iron-weed. (Fig. 3608.)

Vernonia altissima var. *marginata* Torr. Ann. Lyc. N. Y. 2: 210. 1827.
Vernonia Jamesii T. & G. Fl. N. A. 2: 58. 1841.
Cacalia marginata Kuntze, Rev. Gen. Pl. 968. 1891.
Vernonia marginata Britton, Mem. Torr. Club, 5: 311. 1894.

Glabrous or very nearly so, 1°–3° high. Leaves linear or linear-lanceolate, minutely denticulate, 1-nerved, firm, punctate, 2′–5′ long, 1½″–3″ wide, acuminate; inflorescence rather loose; heads slender-peduncled; involucre campanulate or turbinate, 15–30-flowered, 4″–6″ broad; bracts ovate or oval, acute, mucronate or obtusish, purplish, somewhat pubescent, appressed; achenes nearly glabrous, or somewhat pubescent.

Prairies, Nebraska to Texas and New Mexico. Autumn.

2. ELEPHÁNTOPUS L. Sp. Pl. 814. 1753.

Perennial rigid pubescent herbs, with alternate or basal, simple pinnately-veined leaves, and in our species glomerate bracted heads of blue or purple flowers in branching corymbs. Heads discoid, 2–5-flowered. Involucre compressed, oblong, its chaffy bracts imbricated in about 2 series, the 4 outer bracts shorter. Bracts of the glomerules large, foliaceous. Receptacle small, naked. Corolla nearly regular, 5-lobed, but a little deeper cleft on the inner side. Achenes 10-ribbed, truncate. Pappus of rigid persistent awn-like scales or bristles in 1 or 2 rows. [Greek, ivory, or Elephant's-foot.]

About 14 species, natives of tropical or warm regions. Only the following are known to occur in the United States.

Stem and branches usually leafy. 1. *E. Carolinianus.*
Stem scapiform, naked, or with 1 or 2 leaves.
Leaves oblong or oblanceolate, 9″–2′ wide; heads 4″ long. 2. *E. nudatus.*
Leaves ovate, oval, or obovate, 2′–4′ wide; heads 6″ long. 3. *E. tomentosus*

1. Elephantopus Caroliniànus Willd. Carolina Elephant's-foot. (Fig. 3609.)

Elephantopus Carolinianus Willd. Sp. Pl. 3: 2390. 1804.

Erect, hirsute-pubescent, or glabrate above, branched above, 1°–3° high. Leaves oval, ovate, or obovate, thin, the lower rather abruptly narrowed into margined petioles, obtuse, crenate-dentate, 3′–8′ long, 2′–4′ wide, the upper smaller, narrower and sessile; glomerules, including the bracts, nearly 1′ broad; scales of the pappus lanceolate-subulate, gradually narrowed into a long slender awn.

In dry woods, southern New Jersey and Pennsylvania to Florida, west to Kansas and Texas. Aug.–Sept.

2. Elephantopus nudàtus A. Gray. Smoothish Elephant's-foot. (Fig. 3610.)

Elephantopus nudatus A. Gray, Proc. Am. Acad. 15: 47. 1880.

Erect, rather stout, appressed-pubescent, or glabrate, 1°–2° high. Leaves oblong or oblanceolate, obtuse at the apex, gradually narrowed at the base, crenate or repand, 2′–10′ long, 9″–2′ wide, the basal ones usually much larger than those of the stem and branches, or these usually few and bract-like; glomerules 6″–9″ broad; heads about 4″ long; scales of the pappus ovate-triangular, abruptly narrowed into the awn.

In sandy woods, Delaware to Florida, west to Arkansas and Louisiana. Aug.–Sept.

3. Elephantopus tomentòsus L. Woolly Elephant's-foot. Tobacco-weed. (Fig. 3611.)

Elephantopus tomentosus L. Sp. Pl. 814. 1753.

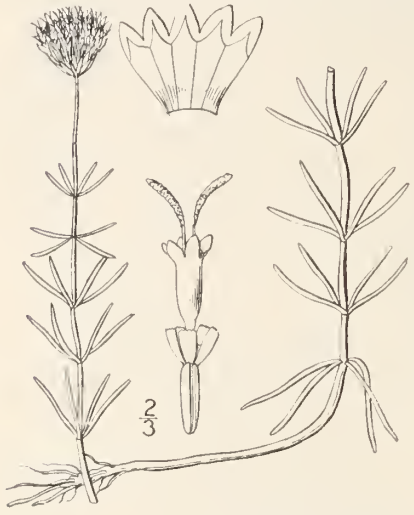
Erect, villous-pubescent, or sometimes glabrate, 1°–2° high, the stem branching above, leafless or with 1 or 2 leaves. Basal leaves ovate, oval, oblong, or obovate, obtuse, sessile, narrowed at the base, usually silky-pubescent beneath, crenate-dentate, 4′–9′ long, 2′–4′ wide; glomerules 1′–1½′ broad; heads about 6″ long; scales of the pappus triangular-subulate, gradually narrowed into the awn.

In moist soil, Virginia to Florida, west to Kentucky, Arkansas and Louisiana. Called also Devil's Grandmother. Aug.–Sept.

3. SCLERÓLEPIS Cass. Bull. Soc. Philom. 1816: 198. 1816.

Slender aquatic herbs, with linear entire verticillate leaves, and solitary (rarely 2–4) discoid peduncled terminal heads of small purplish flowers. Involucre broadly campanulate or hemispheric. Bracts imbricated in about 2 series. Receptacle conic, naked. Corolla regular, its tube short, its limb campanulate, 5-lobed. Anthers obtuse at the base. Style-branches slender, obtuse. Pappus of 5 broad cartilaginous obtuse scales. Achenes 5-angled. [Greek, hard scale, referring to the pappus.]

A monotypic genus of eastern North America.



1. Sclerolepis uniflòra (Walt.) Porter. Sclerolepis. (Fig. 3612.)

AEthulia uniflora Walt. Fl. Car. 195. 1788.
Sparganophorus verticillatus Michx. Fl. Bor. Am. 2: 98. 1803.
Sclerolepis verticillata Cass. Dict. 48: 155. 1827.
Sclerolepis uniflora Porter, Mem. Torr. Club, 5: 311. 1894.

Perennial; stem simple, decumbent at the base, erect or ascending, glabrous or slightly pubescent, 1°–2° long, leafy. Leaves sessile, verticillate in 4's–6's, linear, 1-nerved, 4″–12″ long, ½″–1″ wide, or the submerged ones filiform; head about 5″ broad; bracts of the involucre linear-oblong, acutish, usually puberulent.

In shallow ponds and streams, pine-barrens of New Jersey to Florida. July–Sept.

4. EUPATÒRIUM L. Sp. Pl. 836. 1753.

Erect, mostly branching, perennial herbs, with opposite or verticillate, or sometimes alternate, often punctate leaves, and in our species cymose-paniculate discoid heads of white blue or purple flowers. Involucre oblong, ovoid, campanulate, or hemispheric, the bracts imbricated in 2–several series. Receptacle flat, convex, or conic, naked. Corolla regular, its tube slender, its limb 5-lobed or 5-toothed. Anthers obtuse and entire at the base, appendiculate at the apex. Style-branches elongated, flattened, or thickened above, stigmatic at the base. Achenes 5-angled, truncate. Pappus of numerous capillary usually scabrous bristles arranged in 1 row. [Named for Mithridates *Eupator, i. e.*, of a noble father.]

About 475 species, mostly of warm or tropical regions. Besides the following, some 30 others occur in the southern and western parts of North America.

* Leaves alternate, pinnatifid into filiform segments. 1. *E. capillifolium.*
* * Leaves petioled, verticillate in 3's–6's, or the upper opposite.
Leaves thick, rugose, pubescent; inflorescence depressed. 2. *E. maculatum.*
Leaves thin, nearly glabrous; inflorescence pyramidal. 3. *E. purpureum.*
* * * Leaves opposite (rarely in 3's), or the uppermost alternate.
† *Involucral bracts imbricated in 2 or more series, the outer shorter.*
1. Leaves, at least the lower, slender-petioled. 4. *E. serotinum.*
2. Leaves all sessile, short-petioled or connate-perfoliate.
a. Leaves not clasping nor connate-perfoliate.
½ Leaves narrowed at the base.
Bracts of the involucre acute or cuspidate.
Leaves linear-lanceolate, sparingly toothed, 2″–6″ wide. 5. *E. leucolepis.*
Leaves oblong or lanceolate, coarsely toothed, ½′–1½′ wide. 6. *E. album.*
Bracts of the involucre obtuse.
Leaves linear, crowded, usually entire, obtuse. 7. *E. hyssopifolium.*
Leaves lanceolate, oval, or oblong, usually dentate.
Leaves linear-lanceolate, acute, dentate. 8. *E. Torreyanum.*
Leaves oblong to oval, sharply dentate, obtusish or acute. 9. *E. semiserratum.*
Leaves lanceolate, sparingly dentate, long-acuminate. 10. *E. altissimum.*
½ ½ Leaves rounded, obtuse or truncate at the base.
Plant glabrous; leaves lanceolate, long-acuminate. 11. *E. sessilifolium.*
Plants pubescent; leaves ovate or oblong, acute or obtuse.
Leaves ovate-oblong, rounded at the base, usually obtuse. 12. *E. verbenaefolium.*
Leaves broadly ovate, crenate-dentate, mostly truncate at the base, obtusish. 13. *E. rotundifolium.*
Leaves ovate, dentate, acute. 14. *E. pubescens.*
b. Leaves clasping or connate-perfoliate at the base.
Leaves connate-perfoliate; involucral bracts acute. 15. *E. perfoliatum.*
Leaves merely clasping; involucral bracts obtuse. 16. *E. resinosum.*
† † *Involucral bracts in 1 or 2 series, all equal or nearly so.*
Receptacle flat; flowers white.
Leaves thin, 2′–5′ long, sharply dentate, acuminate. 17. *E. ageratoides.*

Leaves thickish, 1′-2′ long, blunt-toothed, acute or obtusish. Receptacle conic; flowers blue or violet; leaves petioled.

18. *E. aromaticum.*
19. *E. coelestinum.*

1. Eupatorium capillifòlium (Lam.) Small. Dog-fennel. Hog-weed. (Fig. 3613.)

Artemisia capillifolia Lam. Encycl. 1: 267. 1783.
Eupatorium foeniculoides Walt. Fl. Car. 199. 1788.
E. foeniculaceum Willd. Sp. Pl. 3: 1750. 1804.
E. capillifolium Small, Mem. Torr. Club, 5: 311. 1894.

Erect, paniculately much branched, with the aspect of an *Artemisia*, the stem finely pubescent, 4°–10° high. Leaves crowded, glabrous or nearly so, alternate, pinnatifid into filiform segments, the lower petioled, the upper sessile; heads very numerous, about 1½″ high, short-pedicelled, racemose-paniculate, 3–6-flowered; bracts of the involucre in about 2 series, linear, cuspidate, narrowly scarious-margined, glabrous; flowers greenish white.

In fields, Virginia to Florida. Also in the West Indies. Sept.

2. Eupatorium maculàtum L. Spotted Joe-Pye Weed. (Fig. 3614.)

E. maculatum L. Amoen. Acad. 4: 288. 1755.
Eupatorium purpureum var. *maculatum* Darl. Fl. Cest. 453. 1837.

Similar to the following species, but scabrous or pubescent, often densely so, 2°–6° high. Stem usually striate, often rough and spotted with purple; leaves thick, ovate or ovate-lanceolate, coarsely dentate, verticillate in 3's-5's, or the upper ones opposite; inflorescence depressed, cymose-paniculate; pedicels and outer scales of the involucre pubescent; flowers pink or purple.

In moist soil, New York to Kentucky, Minnesota, British Columbia, Kansas and New Mexico. Called also Spotted Boneset. Aug.–Sept.

Eupatorium maculàtum amoènum (Pursh) Britton, Mem. Torr. Club, 5: 312. 1894.
E. amoenum Pursh, Fl. Am. Sept. 514. 1814.

Leaves opposite, or in 3's or 4's, ovate or oblong; heads smaller and fewer; plant low. In dryer places, Virginia to New York.

3. Eupatorium purpùreum L. Joe-Pye or Trumpet-weed. Gravel-root. Tall or Purple Boneset. (Fig. 3615.)

Eupatorium trifoliatum L. Sp. Pl. 837. 1753. ?
Eupatorium purpureum L. Sp. Pl. 838. 1753.

Glabrous or sparingly pubescent, simple, or branched at the summit, 3°–10° high. Stem green or purple, terete or striate, usually smooth; leaves thin, verticillate in 3's–6's, ovate, oval, or ovate-lanceolate, petioled, acuminate, serrate, 4′–12′ long, 1′–3′ wide, glabrous or slightly pubescent along the veins on the lower surface; inflorescence usually elongated; heads very numerous; involucre cylindric, its bracts pink, oblong, obtuse, imbricated in 4 or 5 series, the outer shorter; flowers pink or purple, occasionally white.

In moist soil, New Brunswick to Manitoba, Florida and Texas. Called also Kidney-root, Queen of the Meadow. Aug.–Sept.

Eupatorium purpùreum falcàtum (Michx.) Britton, Mem. Torr. Club, 5: 312. 1894.
E. falcatum Michx. Fl. Bor. Am. 2: 99. 1803.
Eupatorium purpureum var. *angustifolium* T. & G. Fl. N. A. 2: 82. 1841.

Leaves narrower, linear, lanceolate, or linear-oblong, 6″–15″ wide. With the type.

4. Eupatorium serótinum Michx. Late-flowering Thoroughwort. (Fig. 3616.)

E. serotinum Michx. Fl. Bor. Am. 2: 100. 1803.

Much branched, finely and densely pubescent, or glabrate below, 4°–8° high. Leaves all slender-petioled, lanceolate or ovate-lanceolate, acuminate, sharply serrate, 3′–6′ long, ½′–2′ wide, 5-nerved at the base, the lower opposite, the upper alternate; heads very numerous, the inflorescence broadly cymose; heads 7-15-flowered, 2″–3″ high; involucre campanulate, its bracts pubescent, linear-oblong, obtuse or truncate, imbricated in 2 or 3 series, the outer shorter; flowers white.

In moist soil, Maryland to Florida, west to Iowa, Kansas and Texas. Sept.–Nov.

5. Eupatorium leucólepis T. & G. White-bracted Thoroughwort. Justice-weed. (Fig. 3617.)

E. leucolepis T. & G. Fl. N. A. 2: 84. 1841.

Slender, puberulent, branched above, 1°–2° high. Leaves opposite, sessile, linear, oblong or oblong-lanceolate, glaucous green, rough, thick, blunt-pointed, sparingly serrate, or the upper entire, 1′–3′ long, 2″–5″ wide, obscurely 3-nerved and narrowed at the base; inflorescence cymose-paniculate; heads 3″–4″ high, about 5-flowered; bracts of the narrow involucre imbricated in about 3 series, white, lanceolate, acute, densely canescent, the outer shorter; flowers white.

In moist places, pine-barrens of New Jersey to Florida, Georgia and Louisiana. Aug.–Sept.

6. Eupatorium álbum L. White Thoroughwort. (Fig. 3618.)

Eupatorium album L. Mant. 111. 1767.
Eupatorium glandulosum Michx. Fl. Bor. Am. 2: 98. 1803.

Pubescent with spreading hairs, branched above, 1°–3° high. Leaves opposite, sessile or nearly so, oblong or oblong-lanceolate, obtuse, obtusish or the upper acute at the apex, narrowed at the base, coarsely serrate, 1′–4′ long, ½′–1′ wide, rather thick, minutely scabrous above, more or less pubescent beneath; inflorescence cymose-paniculate; heads numerous, 4″–5″ long, 5–7-flowered; involucre narrow, its bracts bright white, linear, cuspidate, imbricated in 3–4 series, the outer short and usually pubescent, the inner much longer, glabrous and shining; flowers white.

In sandy soil, Long Island to Florida, west to Louisiana. Ascends to 3000 ft. in Virginia. Aug.–Sept.

Eupatorium álbum subvenòsum A. Gray, Syn. Fl. 1. Part 2, 98. 1884.

Leaves 1′–2′ long, acute, less coarsely serrate, prominently 3-nerved at the base; bracts of the involucre greenish. Eastern Long Island and New Jersey.

7. Eupatorium hyssopifòlium L. Hyssop-leaved Thoroughwort. (Fig. 3619.)

Eupatorium hyssopifolium L. Sp. Pl. 836. 1753.
E. linearifolium Walt. Fl. Car. 199. 1788.

Roughish-puberulent, densely corymbosely branched above, bushy, 1°–2° high. Leaves linear, opposite, and fascicled in the axils of the stem, or on short axillary branches, entire or very nearly so, ½′–2′ long, 1″–2″ wide, firm, obtuse at the apex, narrowed at the base; inflorescence densely cymose-paniculate; heads 3″–4″ long, about 5-flowered; involucre campanulate, its bracts linear or linear-oblong, obtuse or truncate, sometimes apiculate, puberulent, imbricated in about 3 series, the outer shorter; flowers white.

In dry fields, Massachusetts to Florida and Texas. Called also Justice-weed. Leaf-margins usually revolute. Aug.–Sept. A plant from the coast of Maryland with very narrow leaves, closely approaches *Eupatorium lecheaefolium* Greene, from Florida.

8. Eupatorium Torreyànum Short. Torrey's Thoroughwort. (Fig. 3620.)

Eupatorium Torreyanum Short, 2nd Suppl. Cat. Pl. Ky. 5. 1836.
Eupatorium hyssopifolium var. *laciniatum* A. Gray, Syn. Fl. 1: Part 2, 98. 1884.

Rootstock tuberous-thickened; stem usually densely puberulent, mostly branched above, 1½°–3° high. Leaves opposite, or sometimes in 3's, commouly with short leafy brauches in their axils, often drooping, lauceolate, acute at the apex, narrowed at the base, sessile, 1′–3′ long, 2″–6″ wide, usually distinctly 3-nerved, distantly serrate, the upper and those of the brauches much smaller, linear, entire; inflorescence mostly loose; heads about 3″ high, generally 5-flowered; bracts of the campauulate involucre linear-oblong, obtuse, pubescent, or puberulent, imbricated in about 3 series, the outer shorter; flowers white.

In dry soil, Pennsylvania to North Carolina, Kentucky, Florida and Texas. July–Sept.

9. Eupatorium semiserràtum DC. Small-flowered Thoroughwort. (Fig. 3621.)

Eupatorium ambiguum Hook. Comp. Bot. Mag. 1: 96. In part. 1835.
E. semiserratum DC. Prodr. 5: 177. 1836.

Pubescent or puberulent, loosely branched above, 2°–3° high. Leaves rather thin, short-petioled, oblong-lanceolate to spatulate, acute or obtusish at the apex, narrowed at the base, sharply serrate, at least above the middle, 2′–4′ loug, 5″–12″ wide, 3-nerved, usually with short branches in their axils; inflorescence cymose-paniculate; heads 2″–3″ high, about 5-flowered; involucre campanulate, its bracts linear-oblong, obtuse, cauescent, iubricated in 2 or 3 series, the outer shorter; flowers white.

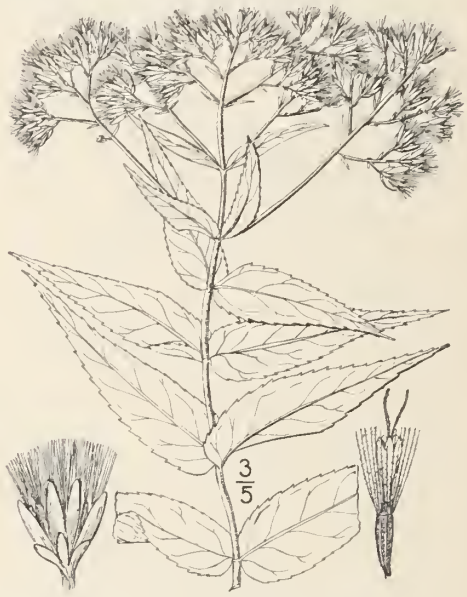
In dry soil, Virginia to Florida, Texas and Arkansas. Aug.–Sept.

10. Eupatorium altíssimum L. Tall Thoroughwort. (Fig. 3622.)

Eupatorium altissimum L. Sp. Pl. 837. 1753.

Densely and finely pubescent, corymbosely much-branched above, 4°–8° high. Leaves lanceolate, acuminate at the apex, tapering below into a short petiole, roughish, rather thick, sparingly dentate above the middle, or some of them entire, strongly 3-ribbed, 2′–5′ long, 5″–12″ wide; inflorescence densely cymose-paniculate; heads about 5-flowered, 3″–4″ high; involucre campanulate, its bracts oblong, obtuse, or truncate, densely pubescent, imbricated in about 3 series, the outer shorter; flowers white.

In dry open places, Pennsylvania to North Carolina and Alabama, west to Iowa, Nebraska and Texas. Sept.–Oct.



11. Eupatorium sessilifòlium L. Upland or Bastard Boneset. (Fig. 3623.)

Eupatorium sessilifolium L. Sp. Pl. 837. 1753.

Glabrous throughout, or pubescent above, branched near the summit, 2°–6° high. Leaves opposite, or the lower rarely in 3's, closely sessile, lanceolate or ovate-lanceolate, long-acuminate, thin, sharply serrate, 3′–6′ long, ½′–1½′ wide, inflorescence cymose-paniculate; heads 4″–5″ high, about 5-flowered; involucre campanulate, its bracts linear-oblong, imbricated in about 3 series, the inner obtuse, the outer acutish, shorter; flowers white.

In dry woods, Massachusetts to Pennsylvania, Illinois and Alabama. Aug.–Oct.

Eupatorium sessilifòlium Brittoniànum Porter, Bull. Torr. Club, 19: 129. 1892.

Leaves ovate or oblong-ovate, sparingly and finely serrate, firm, rounded at the base, acute, the upper 1′–2′ long, 6″–9″ wide, pinnately veined, dark green; cymes dense, their branches puberulent. Budd's Lake, N. J. Perhaps a distinct species.

12. Eupatorium verbenaefòlium Michx. Rough or Vervain Thoroughwort. (Fig. 3624.)

Eupatorium pilosum Walt. Fl. Car. 199. 1788.
Eupatorium verbenaefolium Michx. Fl. Bor. Am. 2: 98. 1803.
E. leucriifolium Willd. Sp. Pl. 3: 1753. 1804.

Rough-pubescent, slender, 3°–8° high, branched at the summit. Leaves opposite, or occasionally in 3's, ovate-oblong, usually obtuse or blunt-pointed, closely sessile or rarely short-petioled, rounded at the base, more or less crenate-dentate, 2′-4′ long, ½′–1′ wide, the upper pairs distant and small; inflorescence cymose-paniculate; heads 5-flowered, about 3″ high; involucre campanulate, its bracts linear-lanceolate, acute, imbricated in about 3 series, densely pubescent, the outer shorter; flowers white.

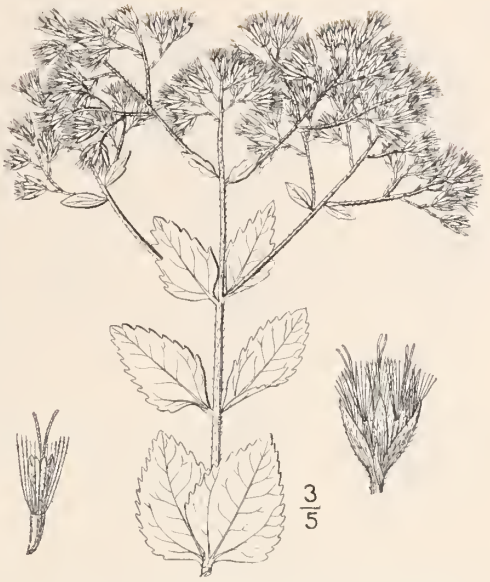
In moist soil, Massachusetts to Pennsylvania, south to Florida and Louisiana. Called also Wild Hoarhound. July–Sept.

13. Eupatorium rotundifòlium L. Round-leaved Thoroughwort. Wild Hoarhound. (Fig. 3625.)

E. rotundifolium L. Sp. Pl. 837. 1753.

Rough-pubescent, branched at the summit, 1°–3° high. Leaves opposite, sessile, broadly ovate, often as wide as long, acutish or obtuse, truncate to subcordate at the base, coarsely dentate-crenate, 1′–2′ long, ascending; inflorescence cymose-paniculate; heads about 5-flowered, 2″–3″ high; involucre campanulate, its bracts linear-oblong, acute, densely pubescent, imbricated in about 3 rows, the outer shorter; flowers white.

In dry soil, southern New York to Florida, Kentucky and Texas. Reported from Canada, but doubtful. July–Sept.



14. Eupatorium pubéscens Muhl. Hairy Thoroughwort. (Fig. 3626.)

E. pubescens Muhl.; Willd. Sp. Pl. 3: 1755. 1804.
Eupatorium rotundifolium var. *ovatum* Torr.; DC. Prodr. 5: 178. 1836.

Puberulent or pubescent, branched above, usually taller than the preceding species. Leaves opposite, ovate, sessile, often twice as long as wide, acute at the apex, rounded or truncate at the base, coarsely dentate with acute or acutish teeth, or the lower incised-dentate; inflorescence cymose-paniculate, sometimes 10′ broad; heads 5–8-flowered, 2″–3″ high; involucre campanulate, its linear-oblong bracts in 2 or 3 series, the outer shorter; flowers white.

In dry soil, Massachusetts to Pennsylvania West Virginia and Florida. Ascends to 3000 ft. in Virginia. July-Sept.

15. Eupatorium perfoliàtum L. Common Thoroughwort. Boneset. Indian Sage. (Fig. 3627.)

E. perfoliatum L. Sp. Pl. 838. 1753.

Pubescent, stout, branched above, 2°–5° high. Leaves opposite, or rarely in 3's, connate-perfoliate, divaricate, lanceolate, long-acuminate with a slender apex, finely crenate-serrate, rugose and pubescent beneath, 4′–8′ long, 1′–1½′ wide; heads crowded, 10–16-flowered, 2″–3″ high; involucre campanulate, its bracts lanceolate, acutish, imbricated in 2 or 3 series, pubescent, the outer shorter; flowers white, rarely blue.

In wet places, New Brunswick to Manitoba, Florida, Nebraska and Texas. Called also Ague-weed, Cross-wort. Wild Sage, Thorough-wax. July–Sept.

Eupatorium perfoliàtum truncàtum (Muhl.) A. Gray, Syn. Fl. 1: Part 2. 99. 1804.
Eupatorium truncatum Muhl.; Willd. Sp. Pl. 3: 1751. 1804.

Leaves separated and truncate, or somewhat rounded at the base. Occasional with the type.

Eupatorium perfoliàtum cuneàtum (Engel.) A. Gray, loc. cit. 100, with leaves smaller, narrowed and separated at the base, occurring in Arkansas and Missouri, is regarded by collectors as a hybrid with *E. serotinum*.

16. Eupatorium resinòsum Torr. Resin Boneset. (Fig. 3628.)

E. resinosum Torr. DC. Prodr. 5: 176. 1836.

Slender, resinous-pubescent, 2°–3° high, branched at the summit, the inflorescence comparatively small, 3′–4′ broad. Leaves opposite, closely sessile, clasping, or slightly connate-perfoliate at the base, linear-lanceolate, long-acuminate, sharply serrate, 3′–6′ long, 3″–6″ wide, roughish above, canescent beneath; heads 10–15-flowered; involucre campanulate, about 2″ high, its bracts oblong, obtuse, imbricated in 2 or 3 series, the outer shorter; flowers white.

In wet places, pine-barrens of New Jersey. Aug.–Sept.

17. Eupatorium ageratoìdes L. f. White Snake-root. White Sanicle. Deerwort Boneset. (Fig. 3629.)

E. ageratoides L. f. Suppl. 355. 1781.

Glabrous or nearly so, much branched, 1°–4° high. Leaves opposite, thin, acuminate at apex, rounded, truncate or cordate at the base, or abruptly narrowed into the slender petiole, coarsely and usually sharply dentate-serrate, sometimes crenate, 3′–6′ long, 1′–3′ wide, 3-nerved and veiny; petioles ½′–2½′ long; inflorescence rather loose, ample; heads 10–30-flowered; receptacle flat; involucre narrowly campanulate, about 2″ high, its bracts linear, acute or acuminate, in 1 or 2 series, equal or nearly so; flowers bright white.

In rich woods, New Brunswick to western Georgia, Ontario, Nebraska, the Indian Territory and Louisiana. Indian Sanicle. July–Nov.

18. Eupatorium aromáticum L. Smaller White Snake-root. (Fig. 3630.)

Eupatorium aromaticum L. Sp. Pl. 839. 1753.

Puberulent or glabrate, slender, branched at the summit, 1°–2° high. Leaves opposite, petioled, firm, obtuse or acutish at the apex, rounded, cordate or sometimes narrowed at the base, crenate-dentate, 1½′–3′ long, 9″–18″ wide, 3-nerved and veiny; petioles 2″–8″ long; inflorescence usually compact; heads 10–25-flowered; receptacle flat; involucre campanulate, 1½″–2″ high, its bracts linear, generally obtuse, in 1 or 2 series; flowers white.

In dry soil, Massachusetts to Florida. Blooms rather later than the preceding species where the two grow together. Called also Poolroot, Poolwort, and Wild Hoarhound. Aug.–Oct.

19. Eupatorium coelestinum L. Mist-flower. (Fig. 3631.)

Eupatorium coelestinum L. Sp. Pl. 838. 1753.
Conoclinium coelestinum DC. Prodr. 5: 135. 1836.

Pubescent or puberulent, branched, 1°–3° high. Leaves opposite, petioled, ovate, obtuse or acute at the apex, truncate at the base, or abruptly contracted into the petiole, crenate-dentate, 1½′–3′ long, 9″–18″ wide; inflorescence cymose-corymbose, rather compact; heads 2″–3″ high; involucre broadly campanulate, its bracts linear-lanceolate, acuminate, equal or nearly so, in 1 or 2 series; receptacle conic; flowers blue or violet.

In moist soil, New Jersey to Florida, west to Illinois, Kansas, Arkansas and Texas. Also in Cuba. Aug.–Oct.

5. WILLUGHBAÈA Neck. Elem. 1: 82. 1790.

[MIKANIA Willd. Sp. Pl. 3: 1742. 1804.]

Herbaceous twining vines, or some tropical species erect shrubs, with opposite, petioled leaves, and discoid, mostly cymose-paniculate heads of whitish flowers. Heads 4-flowered. Involucre oblong, of 4 slightly unequal narrow bracts. Receptacle small, naked. Corolla regular, its tube slender, the limb campanulate, 5-cleft. Anthers entire and obtuse at the base. Style-branches elongated, acutish. Achenes truncate, 5-angled. Pappus of numerous capillary roughish bristles in 1 or 2 series. [Probably named in honor of Francis Willoughby, 1635–1672, English naturalist, but the name spelled by Necker as above.]

About 150 species, natives of America. Besides the following another occurs in the southern United States.

1. Willughbaea scándens (L.) Kuntze. Climbing Hempweed or Boneset. (Fig. 3632.)

E. scandens L. Sp. Pl. 836. 1753.
Mikania scandens Willd. Sp. Pl. 3: 1743. 1804.
Willoughbya scandens Kuntze, Rev. Gen. Pl. 371. 1891.

Glabrous or nearly so, twining over bushes, 5°–15° long. Leaves ovate or hastate, deeply cordate at the base with the lobes rounded or truncate, acuminate at the apex, repand or obtusely dentate, 2′–4′ long, 1′–2′ wide; petioles slender, shorter than the blades; heads in compound clusters borne at the ends of the branches; involucre about 3″ long, its bracts lanceolate, acuminate or apiculate; flowers white or pink; achenes resinous.

In swamps and moist soil, Massachusetts to western Ontario and Indiana, Florida and Texas. Also in the West Indies and South America. July–Sept.

6. COLEOSÁNTHUS Cass. Dict. 10: 36. 1817.

[BRICKELLIA Ell. Bot. S. C. & Ga. 2: 290. 1824.]

Herbs or shrubs, with opposite or alternate leaves, and discoid heads of white yellowish or pink flowers, in panicles or cymes, or rarely solitary. Involucre campanulate or oblong, its bracts striate, imbricated in several series, the exterior ones successively smaller. Receptacle flat or convex, naked. Corolla regular, 5-lobed. Anthers obtuse at the base.

Style-branches long, obtuse. Achenes 10-striate or 10-ribbed. Pappus a single row of numerous rough or serrate bristles. [Greek, sheath-flower.]

A genus of about 60 species. Besides the following some 40 others occur in the southern and western United States.

1. Coleosanthus grandiflòrus (Hook.) Kuntze. Large-flowered Thoroughwort. (Fig. 3633.)

Eupatorium grandiflorum Hook. Fl. Bor. Am. 2: 26. 1834.
Brickellia grandiflora Nutt. Trans. Am. Phil. Soc. (II) 7: 287. 1841.
Coleosanthus grandiflorus Kuntze, Rev. Gen. Pl. 328. 1891.

Erect, glabrous or puberulent, much branched, 2°–3° high. Leaves slender-petioled, deltoid-ovate, cordate at the base, acuminate at the apex, coarsely crenate-dentate, 2′–4′ long, 1′–2′ wide; petioles shorter than the leaves; inflorescence cymose-paniculate; heads short-peduncled, 6″–7″ long; peduncles pubescent; involucre campanulate, 30–45-flowered, the outer bracts ovate, pubescent, usually abruptly acuminate or subulate-tipped, the inner linear, glabrous, striate, obtuse or acute; bristles of the pappus scabrous.

Montana to southern Missouri and New Mexico, west to Oregon and Arizona. Aug.–Sept.

7. KÙHNIA L. Sp. Pl. Ed. 2, 1662. 1763.

Perennial herbs, with alternate punctate resinous-dotted leaves, and discoid heads of white or purplish flowers in terminal cymose corymbs. Involucre turbinate-campanulate, its bracts striate, imbricated in several series, the outer shorter. Corolla regular, the tube slender, the limb 5-lobed. Anthers obtuse and entire at the base, nearly or quite separate. Style-branches slender, obtusish. Achenes 10-striate. Pappus a single row of numerous very plumose bristles. [Named for Dr. Adam Kuhn, of Philadelphia, a pupil of Linnaeus.]

About 8 species, native of North America and Mexico.

Puberulent; leaves sparingly dentate, or entire; heads loosely clustered, 4″–5″ high. 1. *K. eupatorioides.*

Pubescent or tomentulose; leaves sharply serrate; heads densely clustered, 6″–8″ high. 2. *K. glutinosa.*

1. Kuhnia eupatorioìdes L. False Boneset. (Fig. 3634.)

Kuhnia eupatorioides L. Sp. Pl. Ed. 2, 1662. 1763.
Eupatorium alternifolium Ard. Spec. Bot. 2: 40. *pl. 20.* 1764.

Erect, puberulent and resinous, 1°–3° high, branched above. Leaves lanceolate or linear-lanceolate, acute or obtusish at the apex, narrowed at the base, sparingly dentate, or entire, the upper sessile, the lower usually short-petioled; heads several or numerous, peduncled, 4″–5″ high, loosely clustered; outer bracts of the involucre lanceolate or ovate-lanceolate, acuminate, the inner much longer, linear, cuspidate; pappus tawny, or sometimes nearly white.

In dry soil, New Jersey to Georgia, Ohio, West Virginia and Texas. Ascends to 3300 ft. in West Virginia. Aug.–Sept.

2. Kuhnia glutinòsa Ell. Prairie False Boneset. (Fig. 3635.)

Kuhnia glutinosa Ell. Bot. S. C. & Ga. 2: 292. 1821–24.
Kuhnia suaveolens Fresen. Ind. Sem. Francf. 1838.
Kuhnia eupatorioides var. *corymbulosa* T. & G. Fl. N. A. 2: 78. 1841.

Stouter and often taller than the preceding species, corymbosely or paniculately branched, pubescent or tomentulose, somewhat viscid. Leaves all sessile, lanceolate to ovate-lanceolate, usually sharply serrate with distinct teeth, veiny, 1′–3′ long, 3″–10″ wide; or those of the branches linear-lanceolate and entire; heads numerous, 6″–8″ high, densely clustered in the cymes, their peduncles mostly short; inner bracts of the involucre lanceolate, acuminate; pappus tawny or brown.

In dry soil, Illinois to South Dakota, Alabama and Texas. Aug.–Oct.

8. LACINÀRIA Hill, Veg. Syst. 4: 49. *pl. 46.* 1762.

[LIATRIS Schreb. Gen. Pl. 542. 1791.]

Erect perennial herbs, usually from a globular tuber, simple or little branched, with alternate entire narrow 1–5-nerved leaves, and spicate or racemose discoid heads of rose-purple or white flowers. Involucre oblong, ovoid or subhemispheric, its bracts imbricated in several series, the outer shorter. Receptacle flat, or slightly convex, naked. Corolla regular, its tube slender, its limb 5-lobed or 5-cleft. Anthers obtuse at the base. Style-branches elongated, obtuse or flattened at the apex. Achenes 10-ribbed, slender, tapering to the base. Pappus of 1 or 2 series of slender barbellate or plumose bristles. [Latin, fringed, from the appearance of the heads.]

About 16 species, natives of eastern and central North America, known as Blazing Star, or Button Snakeroot from the globular tubers.

* Bracts of the involucre acute, acuminate or mucronate.

Involucre cylindric, or turbinate, 15-60-flowered, its base rounded.
- Bracts with lanceolate spreading rigid tips. — 1. *L. squarrosa.*
- Bracts mucronate, closely appressed. — 2. *L. cylindracea.*

Involucre oblong, or narrowly campanulate, 3–6-flowered.
- Inner bracts with prolonged petaloid tips. — 3. *L. elegans.*
- Bracts all acute, mucronate or acuminate.
  - Bracts appressed; pappus-bristles very plumose.
    - Leaves 1″–2″ wide; spike usually leafy below. — 4. *L. punctata.*
    - Leaves less than 1″ wide; spike mostly naked. — 5. *L. acidota.*
  - Tips of the bracts spreading; pappus-bristles barbellate. — 6. *L. pycnostachya.*

* * Bracts of the involucre rounded or obtuse.

Involucre hemispheric, ½′–1′ broad, 15–45-flowered; heads peduncled. — 7. *L. scariosa.*

Involucre oblong, 2″–4″ broad, 5–15-flowered.
- Involucre rounded at base; bracts usually not punctate; heads mostly sessile. — 8. *L. spicata.*
- Involucre narrowed at base; bracts usually very punctate; heads peduncled. — 9. *L. graminifolia.*

1. Lacinaria squarròsa (L.) Hill. Scaly Blazing Star. Colic-root. (Fig. 3636.)

Serratula squarrosa L. Sp. Pl. 818. 1753.
Lacinaria squarrosa Hill, Veg. Syst. 4: 49. 1762.
Liatris squarrosa Willd. Sp. Pl. 3: 1634. 1804.

Usually stout, ½°–2° high, pubescent or glabrous. Leaves narrowly linear, rigid, sparingly punctate, 3′–6′ long, 1″–2½″ wide; heads sessile or short-peduncled, 15–60-flowered, usually few, or sometimes solitary, ½′–1½′ long, 4″–8″ thick; bracts of the involucre imbricated in 5–7 series, lanceolate, rigid, acuminate, glabrous or pubescent, their tips spreading; flowers bright purple; pappus very plumose.

In dry soil, western Ontario to Kentucky and Florida, west to Minnesota, Nebraska and Texas. Called also Rattlesnake-master. June–Sept.

Lacinaria squarrosa intermedia (Lindl.) Porter, Mem. Torr. Club, 5: 314. 1894.
Liatris intermedia Lindl. Bot. Reg. *pl. 948.* 1825.
Liatris squarrosa var. *intermedia* DC. Prodr. 5: 129. 1836.
Heads narrower; tips of the bracts less spreading. With the type.

2. Lacinaria cylindracea (Michx.) Kuntze. Cylindric Blazing Star. (Fig. 3637.)

Liatris cylindracea Michx. Fl. Bor. Am. 2: 93. 1803.
Liatris graminifolia Willd. Sp. Pl. 3: 1636. 1804.
Lacinaria cylindracea Kuntze, Rev. Gen. Pl. 349. 1891.

Glabrous or nearly so, stout, 1°–1½° high, sometimes branched above. Leaves narrowly linear, rigid, scarcely punctate, 3′–7′ long, 1″–2″ wide; heads several or numerous, peduncled, or the lower sessile, turbinate-cylindric, ½′–1′ high, 4″–6″ thick, 15–60-flowered; bracts of the involucre imbricated in 5 or 6 series, broadly oval, appressed, abruptly acuminate at the apex; flowers purple; pappus very plumose.

In dry soil, western Ontario to Minnesota, south to Illinois and Missouri. July–Sept.

3. Lacinaria élegans (Walt.) Kuntze. Handsome Blazing Star. (Fig. 3638.)

Stoepelina elegans Walt. Fl. Car. 202. 1788.
Liatris elegans Willd. Sp. Pl. 3: 1635. 1804.
Lacinaria elegans Kuntze, Rev. Gen. Pl. 349. 1891.

Densely and finely pubescent, rarely glabrate, 2°–3° high. Leaves linear, very punctate, 1′–5′ long, 1″–3″ wide, the upper much smaller than the lower and soon reflexed; heads 4-5-flowered, 6″–7″ high, narrowly campanulate, very numerous in a dense spike or raceme sometimes a foot long; bracts of the involucre in 2 or 3 series, the inner ones linear, dilated above into oblong or lanceolate acuminate rose-colored petaloid tips, or sometimes white; pappus very plumose; flowers purple.

In dry soil, Virginia to Florida, Alabama and Texas. Aug.–Oct.

4. Lacinaria punctàta (Hook.) Kuntze. Dotted Button-Snakeroot. (Fig. 3639.)

Liatris punctata Hook. Fl. Bor. Am. 1: 306. *pl. 55.* 1833.
Lacinaria punctata Kuntze, Rev. Gen. Pl. 349. 1891.

Glabrous, or sparingly pubescent, 6′–30′ high; rootstock stout, branching, or globose. Leaves linear, rigid, very punctate, 2′–6′ long, about 1″ wide, or the lower 2″, the upper gradually shorter, all erect or ascending; heads 3–6-flowered, 6″–8″ long, sessile, crowded into a dense spike; spike commonly leafy below; involucre narrowly campanulate, acute or acutish at the base, its bracts oblong, cuspidate or acuminate, often ciliate on the margins, sometimes woolly, imbricated in 4 or 5 series; flowers purple; pappus very plumose.

In dry soil, Minnesota and Manitoba to Montana, south to Missouri, Texas, New Mexico and Sonora. Aug.–Oct.

5. **Lacinaria acidòta** (Engelm. & Gray) Kuntze. Slender Button-Snakeroot. (Fig. 3640.)

Liatris acidota Engelm. & Gray, Bost. Journ. Nat. Hist. 5: 218. 1847.
Lacinaria acidota Kuntze, Rev. Gen. Pl. 349. 1891.

Similar to the preceding species, but usually glabrous throughout, the rootstock globose, or elongating. Stem 2° high, or less, slender. Leaves narrowly linear, ¼″–½″ wide, or the lower wider, slightly punctate, 1′–4′ long, the upper gradually shorter; spike slender, naked, or sparingly leafy at the base, 4′–10′ long; heads 3–5-flowered, 6″–9″ long; involucre narrowly oblong-campanulate, its bracts oblong to ovate-lanceolate, more or less punctate, abruptly or gradually acuminate; glabrous or sparingly ciliate; flowers purple; pappus plumose.

Prairies, Kansas (and Missouri, according to Bush) to Texas. Aug.–Oct.

6. **Lacinaria pycnostàchya** (Michx.) Kuntze. Prairie or Hairy Button-Snakeroot. (Fig. 3641.)

Liatris pycnostachya Michx. Fl. Bor. Am. 2: 91. 1803.
Lacinaria pycnostachya Kuntze, Rev. Gen. Pl. 349. 1891.

Hirsute-pubescent above, usually glabrous below, 2°–5° high, very leafy. Lower leaves linear-lanceolate, narrowed below the middle into a slender margined petiole, acuminate at the apex, often 1° long and ½′ wide, the upper much smaller, linear-subulate, rigid, punctate; spikes very dense, 6′–18′ long; heads 4″–6″ long, 3–6-flowered; involucre oblong or cylindric, its bracts oblong, pubescent and ciliate with acute, slightly spreading, colored tips; flowers purple; pappus barbellate or roughened, not plumose.

On prairies, Illinois and Minnesota to Nebraska, south to Kentucky, Louisiana and Texas. Aug.–Sept.

7. **Lacinaria scariòsa** (L.) Hill. Large Button-Snakeroot. (Fig. 3642.)

Serratula scariosa L. Sp. Pl. 818. 1753.
Lacinaria scariosa Hill, Veg. Syst. 4: 49. 1762.
Liatris scariosa Willd. Sp. Pl. 3: 1635. 1804.

Finely pubescent, at least above, 1°–6° high. Lower leaves oblanceolate, spatulate or oblong-lanceolate, narrowed into a margined petiole, acute or obtusish at the apex, often 1° long and 1½′ wide; upper leaves linear or linear-lanceolate, acute, or sometimes very obtuse, much smaller, all densely punctate; heads hemispheric, ½′–1′ broad, 15–45-flowered, on stout peduncles 2″–2′ long, or sometimes sessile; bracts of the involucre imbricated in 5 or 6 series, spatulate-linear, oblanceolate or obovate, rounded at the apex, appressed, their tips dry and scarious, often colored; flowers bluish purple; pappus barbellate.

In dry soil, Maine to Florida, west to Minnesota, western Ontario, Manitoba, Nebraska and Texas. Called also Blue Blazing Star, Gay Feather, Rattlesnake-master. Aug.–Sept.

Lacinaria scariòsa squarrulòsa (Michx.) Small, Mem. Torr. Club, 4: 128. 1894.
Liatris squarrulosa Michx. Fl. Bor. Am. 2: 92. 1803.
Liatris scariosa var. *squarrulosa* A. Gray, Syn. Fl. 1: Part 2, 110. 1884.

Heads smaller, 5″–7″ broad, turbinate-hemispheric. Dry woods, Virginia to Florida and Texas. Ascends to 3300 ft. in West Virginia. Perhaps a distinct species.

Throat-wort, Prairie Pine, Colic-root. Aug.–Oct.

8. Lacinaria spicàta (L.) Kuntze. Dense Button-Snakeroot. Gay Feather. Devil's Bit. (Fig. 3643.)

Serrulata spicata L. Sp. Pl. 819. 1753.
Liatris spicata Willd. Sp. Pl. 3: 1636. 1804.
L. spicata Kuntze, Rev. Gen. Pl. 349. 1891.

Glabrous or nearly so, 2°–6° high. Lower leaves linear-lanceolate or linear-oblong, usually blunt-pointed, sometimes 1° long and 5″ wide, the upper linear or even subulate, somewhat or obscurely punctate; spike generally dense, 4′–15′ long; heads short-oblong or cylindric, 5–13-flowered, 2″–4″ broad, mostly sessile; involucre rounded or obtuse at the base, its bracts appressed, oblong, obtuse and scarious-margined at the apex, obscurely punctate, imbricated in 4–6 series; flowers blue-purple, occasionally white; pappus roughened or barbellate.

In moist soil, Massachusetts to Florida, west to Wisconsin, Kentucky, Louisiana and Arkansas. Called also Rough or Backache-root,

Lacinaria spicàta pùmila (Lodd.) Porter, Mem. Torr. Club, 5: 314. 1894.
Liatris pumila Lodd. Bot. Cab. *pl. 147.* 1821.
Liatris spicata var. *montana* A. Gray, Syn. Fl. 1: Part 2, 111. 1884.

Low, stout, 1°–2° high. Lower leaves broader and shorter, obtuse; spike shorter; heads larger.

9. Lacinaria graminifòlia (Walt.) Kuntze. Loose-flowered Button-Snakeroot. (Fig. 3644.)

Anonymus graminifolius Walt. Fl. Car. 197. 1788.
Liatris graminifolia Pursh, Fl. Am. Sept. 2: 508. 1814. Not Willd. 1804.
Lacinaria graminifolia Kuntze, Rev. Gen. Pl. 349. 1891.

Glabrous, or sparingly pubescent, 1°–3° high. Leaves similar to those of the preceding species, but more conspicuously punctate, usually somewhat ciliate near the base and acute or acutish at the apex; heads spicate or racemose, mostly peduncled; involucre narrowed or acute at the base, 2″–4″ broad, its bracts distinctly punctate, appressed, rounded and scarcely margined at the apex, thick; flowers purple; pappus barbellate; achenes hairy.

In dry soil, Virginia to Florida and Georgia. Ascends to 4200 ft. in North Carolina. Called also Fine-leaved Blazing Star. Aug.–Sept.

Lacinaria graminifòlia pilòsa (Ait.) Britton, Mem. Torr. Club, 5: 314. 1894.
Serrulata pilosa Ait. Hort. Kew. 3: 138. 1789.
Liatris graminifolia var. *dubia* A. Gray, Man. Ed. 2, 185. 1856.

Leaves usually prominently ciliate; heads larger, spicate, racemose, or even paniculate; bracts of the involucre linear-oblong or spatulate, narrowly scarious-margined. In sandy soil, New Jersey to Florida and Alabama.

9. TRÍLISA Cass. Bull. Soc. Philom. 1818: 140. 1818.

Erect perennial herbs, with fibrous roots and alternate simple leaves; those of the stem sessile or clasping, the basal ones narrowed into petioles. Heads small, discoid, of 5–10 purple or white flowers, in terminal thyrsoid or corymbose panicles. Involucre campanulate, its bracts imbricated in 2 or 3 series, the outer scarcely shorter than the inner. Receptacle flat, naked. Corolla regular, its limb 5-lobed. Anthers obtuse and entire at the base. Achenes nearly terete, 10-ribbed. Style-branches slender, obtuse. Pappus of 1 or 2 series of elongated, barbed bristles. [Anagram of *Liatris.*]

Two known species, native of the southeastern United States.

Stem glabrous; heads corymbose-paniculate. 1. *T. odoratissima.*
Stem viscid-pubescent; heads thyrsoid-paniculate. 2. *T. paniculata.*

1. Trilisa odoratíssima (Walt.) Cass. Vanilla-leaf. Vanilla-plant. Dog's-tongue. Carolina Vanilla. (Fig. 3645.)

Anonymos odoratissima Walt. Fl. Car. 198. 1788.
Liatris odoratissima Michx. Fl. Bor. Am. 2: 93. 1803.
Trilisa odoratissima Cass. Bull. Soc. Philom. 1818: 140. 1818.

Rather stout, glabrous, 2°–3° high. Leaves thick, entire, or sometimes dentate, the lower oblanceolate, oblong or spatulate, obtuse, 4′–10′ long, 1′–1½′ wide, those of the stem gradually smaller, oblong, ovate or oval, the uppermost bract-like; heads corymbose-paniculate, about 3″ high; bracts of the involucre oblong, obtusish; achenes glandular-pubescent.

In pine-barrens, Virginia (according to Watson and Coulter) to Florida and Louisiana. Called also Deer's-tongue and Hound's-tongue. Aug.-Sept.

2. Trilisa paniculàta (Walt.) Cass. Hairy Trilisa. (Fig. 3646.)

Anonymos paniculatus Walt. Fl. Car. 198. 1788.
Liatris paniculata Michx. Fl. Bor. Am. 2: 93. 1803.
Trilisa paniculata Cass. Bull. Soc. Philom. 1818: 140. 1818.

Stem viscid-pubescent, 1°–3° high. Leaves entire, the basal ones lanceolate or narrowly oblong, acute or obtusish, 3′–10′ long, ½′–1½′ wide, those of the stem much smaller, lanceolate or oblong-lanceolate; heads thyrsoid-paniculate, about 3″ high; bracts of the involucre oblong, obtusish; achenes finely pubescent.

In pine barrens, Virginia to Florida and Georgia. Sept.-Oct

10. GUTIERRÈZIA Lag. Gen. & Sp. Nov. 30. 1816.

Erect branching, usually glabrous and often glutinous herbs, or shrubs, with linear entire alternate leaves, and small heads of both tubular and radiate yellow flowers, corymbosely paniculate in our species. Radiate flowers few, pistillate. Disk-flowers regular, mostly perfect, or some of them only staminate, the corolla-limb 5-lobed. Involucre ovoid or narrowly campanulate, its bracts coriaceous, imbricated in few series. Receptacle flat, convex or conic, commonly foveolate. Anthers obtuse and entire at the base. Style-branches narrow, flattened, their appendages slender. Achenes terete, ribbed or 5-angled. Pappus of several scales, those of the ray-flowers shorter than or equalling those of the disk. [Named from Gutierrez, a noble Spanish family.]

About 20 species, natives of western North America, Mexico and western South America. Besides the following 4 others occur in the southwestern United States.

1. Gutierrezia Sarothrae (Pursh) Britt. and Rusby. Gutierrezia. (Fig. 3647.)

Solidago Sarothrae Pursh, Fl. Am. Sept. 540. 1814.
Gutierrezia Euthamiae T. & G. Fl. N. A. 2: 193. 1841.
Gutierrezia Sarothrae Britton & Rusby, Trans. N. Y. Acad. Sci. 7: 10. 1887.

Glabrous or minutely pubescent, bushy, ½°–2° high, the branches rigid, ascending. Leaves linear, ½′–1½′ long, ½″–1″ wide, acute; heads oblong, 1½″–2″ high, few-flowered, usually in clusters of 2–5 at the ends of the numerous branches; rays 1–6, scarcely 1″ long; scales of the pappus linear-oblong, subulate or acuminate; achenes pubescent.

In dry or rocky soil, Minnesota and Manitoba to western Nebraska, Texas and Sonora, west to Nevada, Arizona and California. Aug.–Sept.

11. AMPHIÁCHYRIS DC. Not. Pl. Rar. Jard. Gen. 7: 1. *pl. 1.* 1835.

Erect, much branched, glabrous herbs, with small alternate entire leaves, and very numerous small heads of both tubular and radiate yellow flowers, solitary or clustered at the ends of the branches. Involucre ovoid or hemispheric, its bracts coriaceous, imbricated in few series. Receptacle naked. Ray-flowers pistillate. Disk-flowers perfect, but sterile, or staminate. Pappus of the ray-flowers obsolete or coroniform, that of the disk-flowers of 5–20 subulate scales or bristles somewhat united at the base. Achenes pubescent. [Greek, chaff-arouud.]

Two known species, natives of the south-central United States. The genus is closely related to the preceding one.

1. Amphiachyris dracunculoides (DC.) Nutt. Amphiachyris. (Fig. 3648.)

Brachyris dracunculoides DC. Mem. Soc. Phys. Gen. 7: Part 2, 265. *pl. 1.* 1836.
Amphiachyris dracunculoides Nutt. Trans. Am. Phil. Soc. (II) 7: 313. 1841.

Annual, slender, much branched, 6′–18′ high, the branches ascending. Leaves linear, 6″–18″ long, 1″–2″ wide, acutish, the uppermost almost filiform; heads solitary at the ends of short branches, 10–30-flowered, about 2″ high; involucre hemispheric, its bracts oval, obtuse; rays 5–10, about as long as the involucre; disk-flowers mostly staminate, their ovaries abortive, their pappus of 5–8 subulate aristate scales, united into a short cup at the base.

In dry soil, Missouri and Kansas to Texas. Found adventive at Easton, Penna. Sept.–Oct.

12. GRINDÈLIA Willd. Gesell. Nat. Fr. Berl. Mag. 1: 260. 1807.

Perennial herbs, sometimes woody at the base, with alternate sessile or clasping leaves, usually spinulose-dentate, and rather large heads of both discoid and radiate yellow flowers, solitary at the ends of the branches (rays rarely wanting). Involucre hemispheric or depressed, its bracts imbricated in several or many series, usually subulate-tipped. Receptacle flat or convex, naked, foveolate. Ray-flowers fertile. Disk-flowers perfect, or sometimes only staminate. Anthers obtuse and entire at the base. Style-branches narrow, flattened, their appendages linear or lanceolate. Achenes short, thick, sometimes compressed, glabrous, 4–5-ribbed. Pappus of 2–8 soon deciduous awns or bristles. [Named for Prof. H. Grindel, of Riga, 1776–1836.]

About 25 species, natives of western North America, Peru and Chili. Besides the following, some 9 others occur in the western and southwestern parts of North America. Known as Gum-plant or Tar-weed.

Leaves spatulate or oblong, obtuse or obtusish; achenes truncate. 1. *G. squarrosa.*
Leaves linear or linear-oblong, acute; achenes 2-toothed. 2. *G. lanceolata.*

1. Grindelia squarròsa (Pursh) Dunal. Broad-leaved Gum-plant. (Fig. 3649.)

Donia squarrosa Pursh, Fl. Am. Sept. 559. 1814.
Grindelia squarrosa Dunal in DC. Prodr. 5: 315. 1836.

Glabrous, erect or ascending, brauched, 10′–2° high. Leaves oblong or oblong-spatulate, obtuse, more or less clasping at the base, sharply spinulose-dentate, sometimes laciniate, ½′–1½′ long, 3″–6″ wide; heads 10″–15″ broad, very glutinous; bracts of the involucre linear-lanceolate, subulate-tipped, strongly squarrose; achenes truncate, those of the outer flowers usually thicker than those of the iuner; pappus of 2 or 3 awns.

In dry soil, Illinois and Minnesota to Manitoba, south to Missouri, Texas, Nevada and Mexico. Adventive in southern New Jersey. June–Sept.

Grindelia squarròsa nùda (Wood) A. Gray, Syn. Fl. 1: Part 2, 118. 1884.
Grindelia nuda Wood. Bot. Gaz. 3: 50. 1878.

Rays wanting. Missouri and westward with the type.

2. Grindelia lanceolàta Nutt. Narrow-leaved Gum-plant. (Fig. 3650.)

Grindelia lanceolata Nutt. Journ. Acad. Phil. 7: 73. 1834.

Slender, erect, glabrous, branched, about 2° high. Leaves lauceolate or linear, acute at the apex, sessile or clasping at the base, spinulose-dentate, laciniate, or the upper entire, 1′–2′ long, 2″–5″ wide; heads nearly as large as those of the preceding species; bracts of the involucre linear-subulate, the inner erect, the outer spreading; achenes 2-toothed; pappus of 1 or 2 awns.

In dry soil, Tennessee to Kansas, Louisiana and Texas. July–Sept.

13. HETEROTHÈCA Cass. Bull. Soc. Philom. 1817: 137. 1817.

Erect, hirsute or pubescent, branching herbs, with alternate, mostly dentate leaves, and rather large heads of both discoid and radiate yellow flowers, geuerally solitary at the euds of the branches. Involucre hemispheric or broadly campanulate, its bracts imbricated in several series, the outer shorter. Receptacle flat, alveolate. Ray-flowers pistillate. Disk-flowers perfect, or some of them only staminate. Style-branches flat, their appendages lanceolate or triangular. Achenes pubescent, obtuse, those of the ray-flowers thick, those of the disk-flowers flattened. Pappus of the ray-flowers obsolete or of a few caducous bristles, that of the disk-flowers of an inner row of numerous capillary rough bristles, and an outer row of shorter stouter bristles or scales. [Greek, differeut-case, from the dissiuiilar achenes.]

Five or 6 species natives of the southern United States and Mexico.

1. Heterotheca subaxillàris (Lam.) Britt. & Rusby. Heterotheca. (Fig. 3651.)

Inula subaxillaris Lam. Encycl. 3: 259. 1799.
Heterotheca Lamarckii Cass. Dict. Sci. Nat. 21: 131. 1821.
Heterotheca subaxillaris Britt. & Rusby, Trans. N. Y. Acad. Sci. 7: 10. 1887.

Biennial or sometimes annual, 1°–3° high. Basal and lower leaves petioled, ovate or oblong, 2′–3′ long, the upper ones oblong, sessile or clasping, smaller, all acutish or obtuse, dentate; heads rather numerous, 6″–9″ broad; involucre nearly hemispheric, 3″–5″ high, its bracts linear, or slightly dilated above, the inner with scarious margins; rays 10-25; inner bristles of the pappus of the disk-flowers about 2″ long.

In dry soil, Delaware to Florida, Louisiana, Kansas, Arizona and Mexico. July–Sept.

14. CHRYSÓPSIS Nutt. Gen. 2: 150. 1818.

[Diplogon Raf. Amer. Month. Mag. 2: 268. 1818. Not Poiret, 1811.]

Perennial branching herbs, with alternate sessile entire leaves, or the basal ones dentate, and large many-flowered heads of both tubular and radiate yellow flowers (rays wanting in some western species), loosely corymbose, or solitary at the ends of the branches. Involucre campanulate to hemispheric, its bracts narrow, imbricated in several series, the outer shorter. Receptacle usually flat, more or less foveolate. Ray-flowers pistillate. Disk-flowers mostly all perfect. Pappus double in both the disk and ray-flowers, the inner of numerous rough capillary bristles, the outer of smaller or minute scales or bristles. Achenes flattened, oblong-linear or obovate. Style-branches narrow, somewhat flattened, their appendages linear or subulate. [Greek, of golden aspect.]

About 20 species, natives of North America and Mexico. Besides the following, about 8 others occur in the southern and western United States.

Leaves elongated-linear, parallel-veined; achenes linear; involucre campanulate.
- 1°–3° high, silvery-pubescent; leaves grass-like, 3′–12′ long. — 1. *C. graminifolia.*
- 4′–10′ high, woolly-pubescent; leaves rigid, 1′–4′ long. — 2. *C. falcata.*

Leaves oblong, lanceolate, or linear, pinnately veined; achenes obovate, or oval; involucre hemispheric.
- Plant densely woolly-pubescent. — 3. *C. pilosa.*
- Plants hirsute, or villous-pubescent.
  - Heads numerous, corymbose-paniculate; eastern species. — 4. *C. Mariana.*
  - Heads fewer, corymbose, or terminating the branches; western species.
    - Villous-pubescent; leaves oblanceolate, oblong, or lanceolate.
      - Leaves acute. — 5. *C. camporum.*
      - Leaves obtuse. — 6. *C. villosa.*
    - Hirsute-pubescent.
      - Leaves linear, acutish, short. — 7. *C. stenophylla.*
      - Leaves spatulate, obtuse. — 8. *C. hispida.*
    - Pilose-pubescent; leaves oblong-lanceolate. — 9. *C. Nuttallii.*

1. Chrysopsis graminifòlia (Michx.) Nutt. Grass-leaved Golden Aster. (Fig. 3652.)

Inula graminifolia Michx. Fl. Bor. Am. 2: 122. 1803.
Chrysopsis graminifolia Nutt. Gen. 2: 151. 1818.

Slender, corymbosely branched above, very silvery-pubescent, 1°–3° high. Leaves linear, soft, grass-like, 3-5-nerved, shining, the basal ones 4′–12′ long, 2″–5″ wide, the upper much smaller, and the uppermost subulate and erect; heads several or numerous, about ½′ broad, solitary at the ends of the branches; involucre campanulate, its bracts glabrate; achenes linear-fusiform.

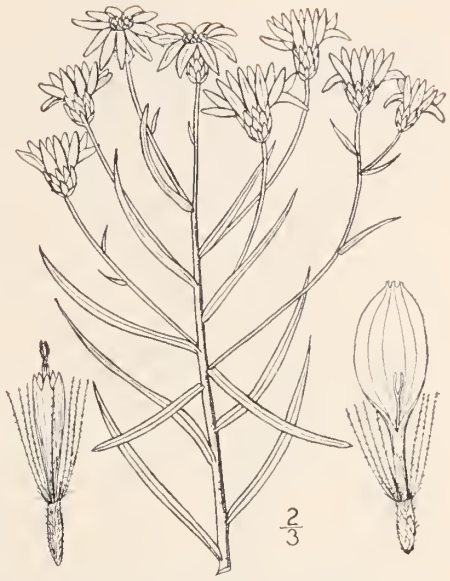
In dry soil, Delaware to Florida, west to Ohio (Cooper in Torrey Herbarium) and Texas. Called also Silver-grass, Scurvy-grass. Aug-Oct.

2. Chrysopsis falcàta (Pursh) Ell. Sickle-leaved Golden Aster. (Fig. 3653.)

Inula falcata Pursh, Fl. Am. Sept. 532. 1814.
Chrysopsis falcata Ell. Bot. S. C. & Ga. 2: 336. 1824.

Corymbosely branched above, rather stiff, 4′–12′ high, leafy to the top, very woolly-pubescent, at least when young, or becoming glabrate. Leaves linear, rigid, spreading, sometimes slightly curved, 1′–4′ long, 1″–3″ wide, obscurely parallel-nerved; heads rather few, 3″–5″ broad, terminating the branches; involucre campanulate, its bracts slightly pubescent; achenes linear.

In sandy soil, eastern Massachusetts to New Jersey. July–Aug.



3. Chrysopsis pilòsa (Walt.) Britton. Cottony Golden Aster. (Fig. 3654.)

Erigeron pilosum Walt. Fl. Car. 206. 1788.
Inula gossypina Michx. Fl. Bor. Am. 2: 122. 1803.
C. gossypina Nutt. Gen. 2: 150. 1818.
Chrysopsis pilosa Britton, Mem. Torr. Club, 5: 316. 1894.

Stout, 1°–2° high, branched above, densely woolly-pubescent all over. Leaves spatulate or oblong, obtuse, the lower and basal ones 1′–3′ long, 3″–5″ wide, the uppermost much smaller; heads usually nearly 1′ broad, terminating the branches, bright yellow; involucre hemispheric, its bracts densely pubescent when young, becoming glabrate; achenes obovate.

In pine-barrens, Virginia (according to Watson and Coulter) to Florida and Alabama. Autumn.

4. Chrysopsis Mariàna (L.) Nutt. Maryland Golden Aster. (Fig. 3655.)

Inula Mariana L. Sp. Pl. Ed. 2, 1240. 1763.
C. Mariana Nutt. Gen. 2: 151. 1818.

Stout, 1°–2½° high, loosely villous-pubescent with silky hairs when young, at length nearly glabrous, corymbosely branched at the summit. Upper leaves oblong or lanceolate, acutish or obtuse, sessile, 1′–2′ long, the lower oblanceolate or spatulate and narrowed into a petiole, generally obtuse, 2′–4′ long and sometimes 1′ wide; heads commonly numerous, 9″–12″ broad, on glandular peduncles; involucre hemispheric, its bracts glandular, acute, viscid-pubescent; achenes obovate.

In dry soil, southern New York and Pennsylvania to Florida and Louisiana. Aug.–Sept.

6. Chrysopsis villòsa (Pursh) Nutt. Hairy Golden Aster. (Fig. 3657.)

Amellus villosus Pursh, Fl. Am. Sept. 564. 1814.

Chrysopsis villosa Nutt. Gen. 2: 151. 1818.

Stem villous or strigose-pubescent, 1°–2° high. Leaves oblong, lanceolate, or oblanceolate, obtuse, 1′–2′ long, 2″–5″ wide, the upper sessile, the lower narrowed into a petiole, pale, persistently canescent with appressed hairs; heads rather few, 1′ broad or more, terminating the short branches; rays oblong-linear, golden yellow; involucre hemispheric, its bracts 4″–5″ high, linear-subulate, pubescent and often ciliate; achenes obovate.

In dry soil, Minnesota and Illinois to Alabama, west to Manitoba, British Columbia and Nebraska. July–Aug.

5. Chrysopsis campòrum Greene. Prairie Golden Aster. (Fig. 3656.)

Chrysopsis camporum Greene, Pittonia, 3: 88. 1897.

Stem villous-pubescent, erect, often branched, 1°–2½° high, leafy up to the inflorescence. Leaves lanceolate to oblong-lanceolate, entire, or with a few low distant teeth, acute, sessile, or the lower narrowed into petioles, appressed-pubescent with short hairs, ciliate, at least near the base, 1′–3′ long, 2″–5″ wide; heads several or solitary at the ends of the branches, 1′–1½′ broad, showy; peduncles 1′–4′ long; involucre nearly hemispheric, ½′ high, its bracts lanceolate, acuminate, pubescent; outer pappus-bristles subulate.

On prairies, Illinois and Kentucky to Missouri. July–Sept.

7. Chrysopsis stenophýlla (A. Gray) Greene. Stiff-leaved Golden Aster. (Fig. 3658.)

Chrysopsis villosa var. *stenophylla* A. Gray, Syn. Fl. 1: Part 2, 123. 1884.

Chrysopsis stenophylla Greene, Erythea, 2: 96. 1894.

Low, slender, hirsute or rough-pubescent, 6′–10′ high. Leaves linear or slightly broadened above, densely canescent and ciliate, acutish, 9″–15″ long, 1″–2″ wide, the margins revolute in drying; involucre hemispheric or broadly campanulate, its bracts pubescent or the outer densely ciliate; heads few, 6″–10″ broad.

In dry soil, Nebraska to Arkansas and Texas. Aug.–Sept.

8. Chrysopsis hispida (Hook.) Nutt. Hispid Golden Aster. (Fig. 3659.)

Diplopappus hispidus Hook. Fl. Bor. Am. 2: 22. 1834.
Chrysopsis hispida Nutt. Trans. Am. Phil. Soc. (II) 7: 316. 1841.
Chrysopsis villosa var. *hispida* A. Gray, Syn. Fl. 1: Part 2, 123. 1884.

Lower than *C. villosa*, stem rarely over 1° high, with spreading hirsute or hispid pubescence. Leaves spatulate to oblong, entire, spreading, 9″–18″ long, obtuse at the apex, narrowed at the base, often into petioles half as long as the blade or more; heads smaller, often more numerous; involucre not over 4″ high, its bracts lanceolate, hirsute.

In dry soil, Manitoba to Idaho, Kansas and Texas. July-Sept.

9. Chrysopsis Nuttàllii Britton. Nuttall's Golden Aster. (Fig. 3660.)

Chrysopsis pilosa Nutt. Journ. Acad. Nat. Sci. Phila. 7: 66. 1834. Not *Erigeron pilosum* Walt. 1788.
C. Nuttallii Britton, Mem. Torr. Club, 5: 316. 1894.

Pilose-pubescent with soft hairs and minutely glandular, 1°–2° high, branched above. Leaves oblong-lanceolate, mostly acute, 1′–2½′ long, 2″–5″ wide, entire, or the lower serrate or even incised; heads few, 8″–12″ broad, terminating the branches; involucre hemispheric, its bracts glandular-viscid; achenes obovate.

In dry soil, Kansas to Louisiana, Arkansas and Texas. July-Sept.

15. CHONDRÓPHORA Raf. New Fl. N. A. 4: 79. 1836.

[BIGELOWIA DC. Mem. Comp. *pl. 5.* 1833. Not *Bigelovia* Spreng. 1821.]

Perennial stiff herbs, with alternate entire leaves, and corymbose-paniculate discoid heads of yellow flowers. Involucre oblong or campanulate, its bracts rigid and glutinous, imbricated in several series. Receptacle flat, generally foveolate, naked. Corolla regular, tubular, the limb 5-cleft. Authers obtuse at the base. Style-branches flatteued, their appendages lanceolate. Achenes obloug, somewhat compressed, 1–2-ribbed on each side. Pappus of 1 or 2 series of numerous capillary uuequal bristles. [Greek, cartilage-bearing.]

One, or perhaps two species, native of eastern North America.

1. Chondrophora nudàta (Michx.) Britton. Rayless Golden-rod. (Fig. 3661.)

Chrysocoma nudata Michx. Fl. Bor. Am. 2: 101. 1803.
Bigelowia nudata DC. Prodr. 5: 329. 1836.
C. nudata Britton, Mem. Torr. Club, 5: 317. 1894.

Glabrous, erect, simple, 1°–2½° high. Lower and basal leaves spatulate, obtuse, or obtusish, 3′–6′ long, 3″–6″ wide, attenuate into a margined petiole; stem leaves distant, small, linear or subulate; heads numerous, 2″–3″ high, crowded in a compound terminal corymbose cyme; involucre narrowly campanulate, acute at the base, its bracts coriaceous, appressed, linear-oblong, imbricated in 3 or 4 series, the outer much smaller than the inuer; achenes short-turbinate; pappus-bristles rigid; edges of the depressions in the receptacle prolouged iuto subulate teeth.

In moist pine-barrens, New Jersey to Florida and Texas. Aug.-Oct.

Chondrophora nudàta virgàta (Nutt.) Britton, Mem. Torr. Club, 5: 317. 1894.
Chrysocoma virgata Nutt. Gen. 2: 137. 1818.
Bigelovia nudata var. *virgata* T. & G. Fl. N. A. 2: 232. 1841.
Chondrophora virgata Greene, Erythea, 3: 91. 1895.

Lower leaves linear, shorter, or the basal ones linear-spatulate. Perhaps specifically distinct. With the type, southward, not certainly known from within our territory.

16. CHRYSOTHÁMNUS Nutt. Trans. Am. Phil. Soc. 629. 7: 323. 1840.

Low shrubs, with equably leafy branches, hard wood, linear leaves, and discoid heads of yellow perfect flowers. Heads narrow, 5–7-flowered. Involucre oblong to narrowly campanulate, its bracts more or less keeled, thin, or papery, imbricated in several series, often so as to form 5 vertical rows. Corolla 5-toothed. Anthers obtuse at the base. Style-branches exserted, their appendages subulate to filiform. Achenes narrow, mostly pubescent. Pappus of copious capillary roughened bristles. [Greek, golden-bush.]

About 25 species, natives of western North America.

Heads about 6″ high; involucral bracts obtuse or mucronulate. 1. *C. nauseosa.*
Heads 7″–10″ high; involucral bracts subulate-tipped. 2. *C. Howardi.*

1. Chrysothamnus nauseòsus (Pursh) Britton. Fetid Rayless Golden-rod. (Fig. 3662.)

C. nauseosa Pursh, Fl. Am. Sept 517. 1814.
C. graveolens Nutt. Gen. 2: 136. 1818.
Bigelovia graveolens A. Gray, Proc. Am. Acad. 8: 644. 1873.
Chondrophora nauseosa Britton, Mem. Torr. Club, 5: 317. 1894.

Densely white-tomentose, at least when young, much branched, very leafy, 1°–6° high, odorous. Leaves linear, or slightly spatulate, 1′–2′ long, 1″–2″ wide; heads 5″–8″ high, very numerous and crowded in terminal compound corymbose cymes, rays none; involucre narrowly campanulate, acute at the base, its bracts oblong or linear-oblong, acutish, puberulent, imbricated in about 4 series; achenes linear; pappus-bristles soft, copious.

In sterile, especially alkaline soil, Northwest Territory to western Nebraska (?) and New Mexico, west to British Columbia and southern California. Aug.–Oct.

2. Chrysothamnus Hówardi (Parry) Greene. Howard's Rayless Golden-rod. (Fig. 3663.)

Linosyris Howardi Parry; A. Gray, Proc. Am. Acad. 6: 541. 1865.
Bigelovia Howardi A. Gray, Proc. Am. Acad. 8: 641. 1873.
Chrysothamnus Howardi Greene, Erythea, 3: 113. 1895.

Similar to the preceding species, densely white-tomentose when young, glabrous or nearly so when old, tufted, much branched, 6′–10′ high. Leaves narrowly linear, entire, 1′–2′ long, about 1″ wide; heads 7″–10″ long, narrow, 5-flowered, more or less glomerate, usually surpassed by the upper leaves; rays none; involucre slightly pubescent, or glabrous, its bracts lanceolate, thin, acuminate or subulate-tipped; achenes nearly linear, pubescent.

In dry soil, western Nebraska, Colorado and Utah to New Mexico. July–Sept.

17. OONÓPSIS Greene, Pittonia, 3: 45. 1896.

Perennial herbs, the following species glabrous, mostly tufted, with woody roots, the stems leafy to the top. Leaves entire, linear to lanceolate. Heads cymose at the end of the stem or branches. Involucre campanulate to ovoid, its bracts flat, imbricated in several series, herbaceous, cuspidate, appressed and erect, or the outer spreading. Disk-flowers with a nearly cylindric 5-toothed corolla. Stamens and style included or scarcely exserted. Ray-flowers present or wanting, pistillate. Style-appendages ovate to subulate. Achenes glabrous, or somewhat pubescent. Pappus-bristles coarse, rigid. [Greek, resembling an egg, referring to the ovoid involucre.]

Four known species, natives of central North America.

1. Oonopsis Engelmánni (A. Gray) Greene. Engelmann's Oonopsis. (Fig. 3664.)

Bigelovia Engelmanni A. Gray, Proc. Am. Acad. 11: 75. 1876.

Oonopsis Engelmanni Greene, Pittonia, 3: 45. 1896.

Perennial by a deep woody root, glabrous throughout; stems stiff, about 8′ high, densely leafy. Leaves narrowly linear, sessile, 9″–18″ long, less than 1″ wide, brittle when dry; heads clustered, or sometimes solitary at the ends of the branches, ½′ wide or less, sessile among the upper leaves; involucre oblong-campanulate, its bracts in about 4 series, oblong to spatulate, short-acuminate or mucronate, appressed; ray-flowers none; disk-flowers about as long as the rather rigid capillary pappus-bristles; achenes linear-oblong, narrowed at the base, many-striate.

Western Kansas and Nebraska. Sept.-Oct.

18. PRIONÓPSIS Nutt. Trans. Am. Phil. Soc. (II) 7: 329. 1841.

A glabrous annual or biennial herb, leafy to the top, with sessile spinulose-dentate leaves, and large heads of yellow radiate and tubular flowers. Involucre broadly hemispheric, its bracts imbricated in several series, lanceolate, acuminate, the outer more or less spreading. Receptacle naked. Disk-flowers perfect, their corollas 5-toothed. Ray-flowers very numerous, pistillate. Achenes glabrous, those of the ray-flowers broader than those of the disk; pappus of a few deciduous rigid unequal bristles, the outer very short. [Greek, resembling a saw, referring to the leaf-margins.]

A monotypic genus of south-central United States.

1. Prionopsis ciliàta Nutt. Prionopsis. (Fig. 3665.)

Donia ciliata Nutt. Journ. Acad. Nat. Sci. Phila. 2: 118. 1821.

Aplopappus ciliatus DC. Prodr. 5: 346. 1836.

Prionopsis ciliata Nutt. Trans. Am. Phil. Soc. (II) 7: 329. 1841.

Stem erect, stout, branched, very leafy, 2°–5° high. Leaves sessile, oval or the lower obovate, obtuse, conspicuously veined, 1′–3′ long, ½′–1½′ wide, sharply serrate with bristle-pointed teeth; heads few, clustered, stalked or nearly sessile, 1′–1½′ broad; involucre depressed-hemispheric, its bracts glabrous; achenes of the ray-flowers ellipsoid, those of the disk-flowers oblong, the central sterile; pappus-bristles rigid, the inner ones rough or ciliate.

On hillsides and river-banks, Missouri and Kansas to Texas. Aug.-Sept.

19. ERIOCÀRPUM Nutt. Trans. Am. Phil. Soc. (II) 7: 320. 1841.

Perennial or annual herbs or shrubs with alternate spinulose-dentate or lobed leaves and many-flowered heads of tubular or of both tubular and radiate yellow flowers (heads rarely without rays). Involucre hemispheric to campanulate, its bracts imbricated in several series, the outer ones gradually smaller. Receptacle flat or convex, generally foveolate, naked. Ray-flowers fertile. Disk-flowers usually perfect. Anthers obtuse and entire at the base. Style-branches flattened, their appendages short, lanceolate. Achenes oblong or obovoid, obtuse, white-tomentose, or canescent, usually 8–10-nerved. Pappus of 1–3 series of numerous capillary persistent more or less unequal bristles. [Greek, woolly fruit.]

About 10 species, natives of America. Besides the following, about 6 others occur in the western parts of the United States.

Rays none; leaves dentate. 1. *E. grindelioides.*
Rays present.
Leaves dentate; annual. 2. *E. rubiginosum.*
Leaves pinnatifid; perennial. 3. *E. spinulosum.*

1. Eriocarpum grindelioides Nutt.

Rayless Eriocarpum. (Fig. 3666.)

Eriocarpum grindelioides Nutt. Trans. Am. Phil. Soc. (II) 7. 321. 1841.

Aplopappus Nuttallii T. & G. Fl. N. A. 2: 240. 1842.

Perennial by a deep woody root, finely pubescent; stems tufted, simple, erect, 4′–12′ high. Leaves oblong-lanceolate to spatulate, sessile, or the lower petioled, ½′–1′ long, firm, acute or obtusish, spinulose-dentate; heads several or solitary, terminating the stem or branches; peduncles 1′ long, or less; involucre campanulate, its bracts linear, acute, puberulent, their tips somewhat spreading, the outer shorter than the inner; achenes densely silky tomentose.

In dry soil, Northwest Territory to South Dakota, Nebraska, Utah and Arizona. July.–Aug.

2. Eriocarpum rubiginòsum (T. & G.) Britton. Viscid Eriocarpum.

(Fig. 3667.)

Aplopappus rubiginosus T. & G. Fl. N. A. 2: 240. 1841.

Eriocarpum rubiginosum Britton, Mem. Torr. Club, 5: 316. 1894.

Viscid, glandular-pubescent, erect, annual, branched near the summit, 1°–3° high. Leaves sessile, or the lowest narrowed into short petioles, oblong, lanceolate, or oblanceolate, conspicuously dentate with distant awn-pointed teeth, acute or obtusish at the apex, 1½′–2½′ long, 2″–6″ wide; heads several, cymose-pauiculate, 8″–15″ broad; involucre hemispheric, its bracts linear-subulate with spreading tips; rays large; pappus bristles rigid, very unequal; achenes villous-canescent, turbinate, not compressed.

Nebraska and Colorado to Texas. Autumn.

3. Eriocarpum spinulòsum (Nutt.) Greene. Cut-leaved Eriocarpum. (Fig. 3668.)

Amellus spinulosus Pursh, Fl. Am. Sept. 2: 564. 1814.
Aplopappus spinulosus DC. Prodr. 5: 347. 1836.
Eriocarpum spinulosum Greene, Erythea, 2: 108. 1894.

Canescent or glabrate, much branched at the base, perennial from thick woody roots, 6′–15′ high. Leaves pinnatifid, sessile, linear to ovate in outline, ½′–1½′ long, 1″–2½″ wide, the lobes with bristle-pointed teeth; heads several or numerous (rarely solitary), 6″–12″ broad; involucre hemispheric, its bracts linear, acute, appressed; rays narrow; achenes pubescent, narrowed below; pappus soft and capillary.

In dry soil, Northwest Territory and North Dakota to Nebraska and Texas, west to Colorado, Arizona and Mexico. March–Sept.

20. STENÒTUS Nutt. Trans. Am. Phil. Soc. (II) 7: 334. 1841.

Low undershrubs, with coriaceous narrow entire evergreen leaves, scapose or leafy stems, and rather large heads of both radiate and tubular yellow flowers. Involucre mostly hemispheric, its bracts imbricated in several series, appressed, ovate to lanceolate. Receptacle alveolate. Disk-flowers perfect, their corollas tubular, usually somewhat enlarged upward, deeply 5-toothed. Ray-flowers fertile. Anthers obtuse at the base. Appendages of the style-branches short, lanceolate. Achenes white-villous. Pappus of soft white capillary bristles. [Greek, narrow, referring to the leaves.]

About 18 species, natives of western North America.

1. Stenotus armerioìdes Nutt. Narrow-leaved Stenotus. (Fig. 3669.)

Stenotus armerioides Nutt. Trans. Am. Phil. Soc. (II) 7: 335. 1841.
Aplopappus armerioides A. Gray, Syn. Fl. 1: Part 2, 132. 1884.

Perennial, tufted from a branched woody caudex, glabrous throughout; flowering stems slender, naked above, or quite leafless, 4′–8′ high. Basal leaves numerous, narrowly spatulate or linear, acute or acutish, firm, 1′–3′ long, 1″–2″ wide, entire, narrowed below; stem leaves usually 1–3, sessile, linear, sometimes none; head commonly solitary, about 1′ broad; involucre campanulate, 4″–6″ high, its bracts broadly oval, green, appressed, obtuse or retuse, scarious-margined, or the inner ovate-oblong and acutish; rays 8–10; achenes canescent or villous; pappus bristles soft, white.

In dry, mostly rocky soil, western Nebraska to Wyoming, Utah and New Mexico. June–July.

21. ISOPÁPPUS T. & G. Fl. N. A. 2: 239. 1841.

Rough-hairy annual or biennial herbs, loosely paniculately branched, with alternate linear to lanceolate 1-nerved entire or somewhat toothed leaves, and small slender-peduncled heads of radiate and tubular yellow flowers. Involucre campanulate-cylindric, its appressed lanceolate or subulate bracts in 2 or 3 series. Receptacle alveolate. Ray-flowers 5–12, pistillate. Disk-flowers 10–20, perfect. Anthers not sagittate. Style-appendages narrow, hirsute. Achenes terete, narrowed below, silky-villous. Pappus a single series of rough capillary bristles, nearly equal in length. [Greek, equal pappus.]

Two known species, natives of the southern United States.

1. Isopappus divaricàtus (Nutt.) T. & G. Isopappus. (Fig. 3670.)

Inula divaricata Nutt. Gen. 2: 152. 1818.
Aplopappus divaricatus A. Gray, Syn. Fl. 1: Part 2, 130. 1884.
Isopappus divaricatus T. & G. Fl. N. A. 2: 239. 1841.

Annual or biennial, erect, paniculately much branched, slender, rough-pubescent or glandular, 1°–3° high. Leaves linear, linear-lanceolate, or the lowest linear-spatulate, acute or cuspidate, dentate with distant teeth, or sometimes entire, 1′–3′ long, 1″–3″ wide, the uppermost much smaller, subulate or bract-like; heads numerous, 3″–5″ broad; involucre campanulate, its bracts linear-lanceolate, subulate-tipped, pubescent, peduncles very slender or filiform.

In dry soil, Kansas to Texas, east to Georgia and Florida. Aug.–Oct.

22. SOLIDÀGO L. Sp. Pl. 878. 1753.

Perennial erect herbs, sometimes woody at the base, simple, or little branched, with alternate simple toothed or entire leaves, and small heads of both tubular and radiate, yellow or rarely white flowers, in terminal or axillary panicles, thyrsi, or cymose-corymbose or capitate clusters. Involucre oblong or narrowly campanulate, its bracts imbricated in several series, the outer successively shorter. Receptacle small, flat, or somewhat convex, generally alveolate. Ray-flowers in one series, pistillate. Disk-flowers mostly all perfect, their corollas tubular or narrowly campanulate, 5-cleft or 5-lobed. Anthers obtuse and entire at the base. Style-branches flattened, their appendages lanceolate. Achenes terete or angled, usually ribbed. Pappus of numerous capillary rough nearly equal bristles in 1 or 2 series. [Greek, to make whole.]

About 85 species, mostly of North America, 2 or 3 in Europe, a few in Mexico and South America.

A. Tips of the involucral bracts, or some of them spreading or recurved.

Leaves glabrous or glabrate, 4′–10′ long. 1. *S. squarrosa.*
Leaves rough-ciliate, 1′–2′ long. 2. *S. petiolaris.*

B. Tips of the involucral bracts all erect and appressed.

✲ **Heads in axillary clusters, or also in a terminal spike-like, sometimes branched thyrsus.**

1. Heads 2″–3″ high, chiefly in axillary clusters; achenes pubescent.
Stem and branches terete; leaves lanceolate to oblong. 3. *S. caesia.*
Stem and branches grooved or angled.
Leaves broadly oval, contracted into margined petioles. 4. *S. flexicaulis.*
Leaves lanceolate, sessile. 5. *S. Curtisii.*

2. Heads 2″–3″ high, chiefly in a terminal spike-like thyrsus; achenes glabrous, or nearly so.
Rays white; stem pubescent. 6. *S. bicolor.*
Rays yellow; stem densely pubescent. 7. *S. hispida.*
Rays yellow; stem glabrous, or sparingly pubescent.
Leaves thick, not acuminate, dentate, or the upper entire. 8. *S. erecta.*
Leaves thin, acuminate, sharply serrate. 9. *S. monticola.*

3. Heads 5″–6″ high; bracts elongated, acute; leaves ovate. 10. *S. macrophylla.*

✲ **Heads in a terminal simple or branched thyrsus, not at all secund on its branches, or scarcely so.**

1. Bracts of the involucre acute.
High northern; leaves spatulate, glabrous. 44. *S. multiradiata.*
Eastern; stem minutely puberulent or glabrous; heads 2½″–3″ high. 11. *S. puberula.*
Western; stem and leaves scabrous or rough-pubescent. 12. *S. Lindheimeriana.*

2. Bracts of the involucre obtuse (or the inner acutish in No. 13).
(**a**) Upper leaves abruptly smaller than the lower, appressed. 13. *S. stricta.*
(**b**) Leaves gradually smaller upward, spreading or ascending.
† *Lower leaves large, oblong or oval, acute or obtusish.*
‡ At least the lowest leaves dentate; plants 2°–6° high.
Lower leaves oblong-lanceolate; branches of the thyrsus appressed. 14. *S. uliginosa.*
Lower leaves ovate or broadly oval; branches of the thyrsus ascending. 15. *S. speciosa.*
‡ ‡ Leaves lanceolate or oblong-lanceolate, entire, 1′–5′ long. 16. *S. rigidiuscula.*
† † *Basal leaves narrowly spatulate.* 17. *S. Purshii.*
† † † *Basal leaves obovate, oblanceolate, or broadly spatulate.*
Plant 3′–12′ high, on alpine summits; stem angular. 18. *S. alpestris.*
Plant 1°–3° high, not alpine; heads 3″–4″ high. 19. *S. Virgaurea.*

✲ ✲ ✲ **Heads in a terminal, usually large panicle, secund on its spreading or recurved branches.**

‡ Plant maritime; leaves thick, fleshy, entire. 20. *S. sempervirens.*
‡‡ Plants not maritime; leaves not fleshy.
1. Leaves pinnately-veined, not triple-nerved.
(**a**) Leaves all entire, thin and glabrous. 21. *S. odora.*

(**b**) Leaves, at least the lower, more or less dentate or serrate.

† *Leaves linear or linear-oblong, 1′–2′ long, scabrous.* 22. *S. tortifolia.*

† † *Leaves broader, lanceolate, oblong, or ovate, 2′–10′ long.*

‡ Stem densely pubescent; leaves more or less so.

Leaves rugose-veiny beneath, sharply serrate. 23. *S. rugosa.*
Leaves not rugose, sparingly dentate or entire. 24. *S. fistulosa.*

‡ ‡ Stem glabrous, or merely puberulent above.

Leaves very rough on the upper surface, serrulate. 25. *S. patula.*
Leaves smooth, or minutely roughened on the upper surface.
Racemes few, widely divergent, very slender.
Lower leaves oblong, coarsely serrate. 26. *S. ulmifolia.*
Lower leaves ovate or lanceolate, rather finely serrate. 27. *S. Bootii.*
Racemes numerous, spreading, recurved or ascending.
Leaves all oblong or oblong-lanceolate, sessile. 28. *S. Elliottii.*
At least the lower leaves petioled, lanceolate or ovate-lanceolate.
Leaves firm, ovate-lanceolate or oblong-lanceolate; heads about 2″ high; racemes short; rays several. 29. *S. neglecta.*
Leaves firm, narrowly lanceolate; heads about 2″ high; racemes few, short; rays 1–3. 30. *S. uniligulata.*
Leaves firm, lanceolate or oval-lanceolate; heads 1½″–2″ high; racemes numerous, slender. 31. *S. juncea.*
Leaves thin, the lower broadly ovate, short-acuminate; heads 2½″–3½″ high; racemes numerous. 32. *S. arguta.*

2. Leaves triple-nerved, *i. e.*, with a pair of lateral veins much stronger than the others.

Stem glabrous; bracts of the involucre obtuse.
Leaves, and bracts of the involucre thin.
Leaves linear-lanceolate, entire or sparingly serrate. 33. *S. rupestris.*
Leaves lanceolate, sharply serrate. 34. *S. serotina.*
Leaves, and bracts of the involucre thick, somewhat rigid.
Leaves linear-lanceolate or lanceolate; achenes glabrous. 35. *S. Missouriensis.*
Leaves oblong-lanceolate; achenes silky-pubescent. 36. *S. Shortii.*
Basal leaves oblanceolate, upper bract-like. 37. *S. Gattingeri.*
Stem pubescent or scabrous.
Leaves lanceolate, sharply serrate or entire, rough above. 38. *S. Canadensis.*
Leaves oblanceolate, spatulate, oblong, or ovate, the lower crenate.
Minutely rough-pubescent, grayish; lower leaves oblanceolate; heads 2″ high. 39. *S. nemoralis.*
Canescent and pale; leaves oblong or ovate; heads 3″ high. 40. *S. mollis.*
Very scabrous, green, not grayish nor canescent. 41. *S. radula.*
Leaves broadly ovate-oval, sharply serrate, finely pubescent. 42. *S. Drummondii.*

* * * * Heads in a terminal, corymbiform, sometimes thyrsoid cyme, forming a flat-topped inflorescence.

Leaves ovate, oblong, or oval, very rough on both sides. 43. *S. rigida.*
Leaves lanceolate, linear, oblong, or oblanceolate, glabrous or nearly so.
Leaves, at least the lower, oblanceolate; high northern. 44. *S. multiradiata.*
Leaves not oblanceolate nor spatulate.
Lower leaves oblong-lanceolate, serrulate. 45. *S. Ohioensis.*
Leaves all lanceolate or linear, entire.
Stout; leaves lanceolate, the basal 8′–12′ long. 46. *S. Riddellii.*
Slender; leaves linear, the basal 4′–5′ long. 47. *S. Houghtoni.*

1. Solidago squarròsa Muhl. Stout Ragged Golden-rod. (Fig. 3671.)

Solidago squarrosa Muhl. Cat. 76. 1813.

Stem stout, simple, or rarely branched above, glabrous or puberulent, 2°–5° high. Upper leaves oblong, acute, entire or nearly so, sessile; lower and basal leaves obovate, oval, or broadly spatulate, acute or obtuse, 4′–10′ long, 1′–3′ wide, sharply dentate, often narrowed into a margined petiole, all glabrous, or sometimes slightly pubescent; heads 15-25-flowered, 4″–5″ high, numerous in a terminal narrow often leafy thyrsus sometimes 12′ in length; rays 10–15, showy, 2″–3″ long; tips of the involucral bracts green, acute or obtuse, rarely some of them erect, all usually strongly recurved, giving the heads a ragged appearance; achenes glabrous.

In rocky soil, New Brunswick and Ontario, south to Virginia and Ohio. Ascends to 2000 ft. in the Catskills. Lower branches of the inflorescence sometimes elongated. Aug.-Oct.

2. Solidago petiolàris Ait. Downy Ragged Golden-rod. (Fig. 3672.)

Solidago petiolaris Ait. Hort. Kew. 3: 216. 1789.

Stem rather slender, pubescent or puberulent, 1°–3° high, simple, or branched above. Leaves sessile, or very short-petioled, oblong to oval, acute, obtuse or mucronate, entire or dentate, ½′–3′ long, rough or ciliate on the margins; heads 3″–4″ high, in a terminal narrow more or less compound thyrsus; involucral bracts with green acute to acuminate tips, the outer spreading, the inner appressed; achenes glabrous or nearly so.

In dry soil, Illinois to Kansas and Texas, east to North Carolina and Florida. Variable, or perhaps includes several species. Sept.–Oct.

3. Solidago caèsia L. Blue-stemmed or Wreath Golden-rod. (Fig. 3673.)

Solidago caesia L. Sp. Pl. 879. 1753.
S. gracilis Poir. in Lam. Encycl. 8: 476. 1808.

Stem glabrous, slender, often glaucous, usually bluish or purple, branched or simple, terete, 1°–3° high. Leaves lanceolate or oblong-lanceolate, sessile, acuminate at the apex, narrowed at the base, glabrous, sharply serrate, 2′–5′ long, 3″–15″ wide; heads 2″–3″ high, in axillary clusters or racemes, or occasionally with some in a short terminal thyrsus; bracts of the involucre obtuse, appressed; achenes pubescent.

In woods and thickets, Maine and Ontario to Minnesota Florida, Arkansas and Texas. Called also Woodland Golden-rod. Aug.–Oct.

Solidago caèsia axillàris (Pursh) A. Gray, Proc. Am. Acad. 17: 189. 1882.
S. axillaris Pursh, Fl. Am. Sept. 542. 1814.

Heads few, in dense short axillary clusters, much exceeded by the long thin leaves; upper leaves often entire. Nova Scotia to Ontario and New Jersey.

4. Solidago flexicàulis L. Zig-zag or Broad-leaved Golden-rod. (Fig. 3674.)

Solidago flexicaulis L. Sp. Pl. 879. 1753.
Solidago latifolia L. loc. cit. 1753.

Stem glabrous, angled, usually simple, zig-zag, 1°–3° high. Leaves thin, ovate, acuminate at the apex, abruptly narrowed at the base into a margined petiole, somewhat pubescent, or glabrous beneath, sharply serrate, 2′–7′ long, 1′–4′ wide, the uppermost sometimes lanceolate and entire or nearly so; heads about 3″ high, in short axillary racemose clusters, and rarely also in a narrow terminal thyrsus; bracts of the involucre obtuse to acutish, appressed; achenes hirsute-pubescent.

In rich woods, New Brunswick to Georgia, west to Minnesota and Missouri. Ascends to 2300 ft. in the Catskills. July–Sept.

5. Solidago Curtísii T. & G. Curtis' Golden-rod. (Fig. 3675.)

Solidago Curtisii T. & G. Fl. N. A. 2: 200. 1841.

Stem glabrous or sparingly pubescent, simple or branched, slender, 1½°–3° high, angled and grooved. Leaves thin, sessile, elongated-lanceolate or sometimes broader above the middle, long-acuminate, narrowed below into an entire base, sharply serrate, 3′–6′ long, 4″–12″ wide, glabrous or nearly so; heads 2″–3″ high, in rather loose axillary clusters and sometimes also in a narrow terminal thyrsus; bracts of the involucre few, obtuse.

In mountain woods, Virginia and West Virginia to Georgia. Aug.–Sept.

6. Solidago bícolor L. White Golden-rod. Silver-rod. (Fig. 3676.)

Solidago bicolor L. Mant. 114. 1767.

Stem rather stout, hirsute-pubescent, or nearly glabrous, 6′–4° high, simple or branched. Basal and lower leaves obovate or broadly oblong, mostly obtuse, 2′–4′ long, 1′–2′ wide, narrowed into long margined petioles, dentate or crenate-dentate, more or less pubescent; upper leaves smaller and narrower, oblong or sometimes lanceolate, obtusish or acute, sessile or nearly so, often entire; heads 2″–3″ high, crowded in a terminal narrow thyrsus 2′–7′ long, and sometimes also clustered in the upper axils; rays white; bracts of the involucre obtuse; achenes glabrous.

In dry soil, New Brunswick to Georgia, west to Ontario, Minnesota and Missouri. Ascends to 6300 ft. in North Carolina. July–Sept.

7. Solidago híspida Muhl. Hairy Golden-rod. (Fig. 3677.)

S. hispida Muhl.; Willd. Sp. Pl. 3: 2063. 1804.
Solidago hirsuta Nutt. Journ. Phil. Acad. 7: 103. 1834.
Solidago bicolor var. *concolor* T. & G. Fl. N. A. 2: 197. 1841.

Stout, stem densely pubescent or hirsute, simple, or sometimes branched, 1½°–3° high. Lower leaves oval, acute, or obtuse, petioled, pubescent on both sides, usually dentate, 2′–5′ long, 1′–2′ wide; upper leaves oblong, sessile, acute, dentate or entire, smaller, sessile; heads about 3″ high, crowded in a dense narrow terminal thyrsus and also often in racemose clusters in the upper axils; rays yellow; involucral bracts obtuse; achenes with a few appressed hairs, or glabrous.

In dry soil, Nova Scotia to western Ontario and Minnesota, south to Pennsylvania, Georgia and Wisconsin. More abundant northward than the preceding species. Ascends to 2000 ft. in the Catskills. Aug.–Oct.

8. Solidago erécta Pursh.
Slender Golden-rod. (Fig. 3678.)

Solidago erecta Pursh, Fl. Am. Sept. 542. 1814.
Solidago speciosa var. *angustata* T. & G. Fl. N. A. 2: 205. 1841.

Stem slender, glabrous, or puberulent above, 2°–3° high, simple or rarely branched. Leaves firm, nearly glabrous on both sides, ciliolate on the margins, the lower and basal ones broadly oblong or oval, obtuse or obtusish, crenate-dentate, the upper lanceolate or oblong-lanceolate, acute, usually quite entire; heads 2″–3″ high in a very narrow terminal thyrsus, rarely also with a few clustered in the upper axils; bracts of the involucre obtuse; achenes glabrous.

In dry soil, New Jersey and Pennsylvania to Georgia and North Carolina. Aug.–Sept.

9. Solidago montícola T. & G.
Mountain Golden-rod. (Fig. 3679.)

Solidago Curtisii var. *monticola* T. & G. Fl. N. A. 2: 200. 1841.
Solidago monticola T. & G.; Chapm. Fl. S. States, 209. 1860.

Slender, glabrous or nearly so, 1°–3° high. Stem leaves ovate-oblong, or oblong-lanceolate, thin, acuminate at the apex, narrowed at the base, sharply and sparingly serrate, or the upper entire, 1′–6′ long, 4″–1½′ wide, the upper sessile, the lower petioled; basal leaves broadly oblong, obtuse, with slender petioles; heads about 2″ high; in a terminal spike-like simple or branched thyrsus; bracts of the involucre acutish or obtuse; achenes glabrous.

In mountain woods, Pennsylvania and Maryland to Georgia and Alabama.

10. Solidago macrophýlla Pursh.
Large-leaved Golden-rod. (Fig. 3680.)

Solidago macrophylla Pursh, Fl. Am. Sept. 542. 1814.
Solidago thyrsoidea E. Meyer, Pl. Lab. 63. 1830.

Stem striate, glabrous or sparingly pubescent, stout, 6′–4° high. Leaves thin, ovate, acuminate, or the basal ones obtuse, sharply serrate, glabrous, or sparingly pubescent beneath, 3′–5′ long, 1′–2½′ wide, abruptly contracted into margined petioles, or the uppermost lanceolate, entire, sessile; heads 5″–6″ high in a terminal compact or loose thyrsus and usually also in axillary clusters; bracts of the involucre linear, acute; rays 8–10, linear-oblong, conspicuous; achenes glabrous or nearly so.

In rocky woods, Catskill Mountains, N. Y. to Labrador and Hudson Bay, west to Lake Superior. Ascends to 4000 ft. in the Adirondacks. July–Sept.

11. Solidago pubérula Nutt. Downy Golden-rod. (Fig. 3681.)

Solidago puberula Nutt. Gen. 2: 162. 1818.

Minutely puberulent, or glabrous, usually simple, rather slender, 1½°–3° high, leafy. Stem leaves oblong-lanceolate, acute, sparingly serrate or entire, 1′–2′ long, sessile, or the lower petioled, basal leaves and sometimes the lowest ones of the stem spatulate, obtuse, sharply serrate, 2′–4′ long, narrowed into margined petioles; heads 2½″–3″ high, in a terminal, often leafy thyrsus, the branches of which are spreading or ascending; bracts of the involucre subulate, very acute; achenes glabrous; heads rarely a little secund.

In sandy soil, New Brunswick to Florida and Mississippi, near the coast and on sandstone rocks in the Appalachian mountain system. Aug.–Sept.

12. Solidago Lindheimeriàna Scheele. Lindheimer's Golden-rod. (Fig. 3682.)

Solidago Lindheimeriana Scheele, Linnaea, 21: 599. 1848.

Scabrous, simple, 1½°–3° high, leafy, rather stout and rigid. Leaves oblong, oblong-lanceolate or oval, acute or acutish at the apex, narrowed or rounded at the base, all entire, thickish, rough on both surfaces, sessile or the lowest petioled; heads about 3″ high in a terminal, often short thyrsus; bracts of the involucre acute or the outer obtuse, puberulent; achenes nearly glabrous.

Southern Kansas (according to Watson and Coulter) to Texas, Arizona and northern Mexico. Aug.–Nov.

Solidago Bigelòvii A. Gray, Proc. Am. Acad. 16: 80, another southwestern species, which is rougher than this one, and with oval or oblong leaves obtuse or obtusish at both ends, is reported from Kansas.

13. Solidago stricta Ait. Wand-like or Willow-leaf Golden-rod. (Fig. 3683.)

Solidago stricta Ait. Hort. Kew. 3: 216. 1789.
S. virgata Michx. Fl. Bor. Am. 2: 117. 1803.

Glabrous throughout, slender, erect, simple, 2°–8° high. Basal and lowest stem leaves oblong, or somewhat spatulate, with few lateral veins, obtuse, entire, or very sparingly dentate, 3′–8′ long, ½′–1′ wide, narrowed into long petioles; upper stem leaves abruptly smaller, narrowly oblong, spatulate or linear, appressed, the uppermost very small and bract-like; heads about 3″ high in a dense simple, or sometimes branched, naked thyrsus; bracts of the involucre oblong, obtuse, or the inner acutish; achenes glabrous, or sparingly pubescent.

In wet sandy pine-barrens, New Jersey to Florida and Louisiana. Also in Cuba. Aug.–Oct.

14. Solidago uliginòsa Nutt. Bog Golden-rod. (Fig. 3684.)

Solidago uliginosa Nutt. Journ. Phil. Acad. 7: 101. 1834.

Stem glabrous, rather stout, simple, 2°–4° high. Leaves oblong-lanceolate or lanceolate, glabrous, firm, more or less ciliolate or scabrous on the margins, few-veined, acute or acuminate, the lower and basal ones 4′–9′ long, ½′–1½′ wide, more or less serrate and narrowed into petioles, the upper smaller, mostly sessile and entire; heads 2″–3″ high in a terminal oblong dense thyrsus, its branches appressed; bracts of the involucre linear-oblong, obtuse; achenes glabrous.

In swamps and bogs, Newfoundland to northern New Jersey and Pennsylvania, west to western Ontario, Minnesota and Wisconsin. Aug.–Sept.

15. Solidago speciòsa Nutt. Showy or Noble Golden-rod. (Fig. 3685.)

Solidago speciosa Nutt. Gen. 2: 160. 1818.

Stem stout, glabrous below, often rough above, usually simple, 3°–7° high. Leaves glabrous, firm, the lower and basal ovate, or broadly oval, 4′–10′ long, 1′–4′ wide, dentate or crenate, pinnately veined, acute or obtuse at the apex, long-petioled; upper leaves smaller, oblong or oval, acute at each end, crenate-dentate, or entire, sessile or short-petioled, rough-margined; heads 3″–4″ high in a large terminal thyrsus, the branches of which are ascending and often leafy; bracts of the involucre oblong, very obtuse; achenes glabrous or nearly so.

In rich soil, Nova Scotia to North Carolina, west to Minnesota, Kentucky, Arkansas and Nebraska (according to J. M. Bates) Aug.–Oct.

Solidago speciòsa pállida Porter, Bull. Torr. Club, 19: 130. 1892.

Leaves ovate or oblong, coriaceous, prominently veined, pale green; stems stout, tufted, 1°–2° high, densely pubescent above. On the rocky summit of Mt. Mackay, western Ontario.

16. Solidago rigidiúscula (T. & G.) Porter. Slender Showy Golden-rod. (Fig. 3686.)

Solidago speciosa var. *rigidiuscula* T. & G. Fl. N. A. 2: 205. 1841.

Solidago speciosa var. *angustata* A. Gray, Syn. Fl. 1: Part 2, 152. In part. 1884.

Solidago rigidiuscula Porter, Mem. Torr. Club, 5: 319. 1894.

Stem rather slender, usually glabrous below, rough-pubescent above, simple, 2°–4° high. Leaves lanceolate or oblong-lanceolate, entire, or the basal ones sometimes crenate, strongly ciliolate on the margins, 1′–5′ long, 3″–12″ wide, the upper sessile, the lower sometimes narrowed into petioles; heads similar to those of the preceding species; thyrsus generally narrow, dense, simple or rarely branched,

In dry soil, mostly on prairies, Ohio to Alabama, west to Minnesota, Nebraska, Louisiana and Texas. Aug.–Oct.

17. Solidago Púrshii Porter. River-bank Golden-rod. (Fig. 3687.)

Solidago humilis Pursh, Fl. Am. Sept. 543. 1814. Not Mill.
Solidago Purshii Porter, Bull. Torr. Club, 21: 311. 1894.
S. racemosa Greene, Pittonia, 3: 160. 1897.

Glabrous or nearly so; stems simple, usually somewhat glutinous, 6′–18′ high. Lower and basal leaves oblanceolate, obtuse or acutish, dentate, or crenate, 2′–6′ long, ½′–1′ wide, narrowed into slightly margined petioles; stem leaves sessile, lanceolate, oblong or linear, numerous, crenate or entire, mostly acute, smaller; heads 3″–4″ high in a terminal simple or branched thyrsus; bracts of the involucre linear-oblong, obtuse, or the inner acutish; achenes striate, pubescent.

On rocky river-banks, Newfoundland to northern New York, Vermont and Virginia. July-Sept.

18. Solidago alpéstris Wald. & Kit. Alpine Golden-rod. (Fig. 3688.)

Solidago alpestris Wald. & Kit. Pl. Rar. Hung. 3. *pl. 208.* 1812.
Solidago Virgaurea var. *alpina* Bigel. Fl. Bost. Ed. 2, 307. 1824.

Glabrous, or somewhat pubescent; stems simple, often tufted, 3′–12′ high, ascending, or erect, angular. Basal leaves obovate, or broadly spatulate, serrate with low sharp or blunt teeth, at least above the middle, obtuse, or acute, 2′–4′ long, narrowed into petioles; stem leaves oblanceolate, spatulate, or oblong, sessile, or the lower petioled, mostly distant; inflorescence a short raceme or thyrsus, with clusters of heads in the axils of the leaves; heads 3″–4″ high; bracts of the involucre obtuse or acute; achenes pubescent.

Alpine summits of the mountains of Maine, New Hampshire and northern New York, mostly above timber line. Also in Europe. Aug.-Sept.

19. Solidago Virgàurea L. European Golden-rod. (Fig. 3689.)

Solidago Virgaurea L. Sp. Pl. 880. 1753.

Somewhat pubescent, at least above; stem usually simple, rather stout, 1°–2° high. Basal leaves oblanceolate, broadly spatulate, or obovate, 3′–5′ long, 1′ wide, or less, obtuse or acute, mostly dentate, narrowed into margined petioles; stem leaves sessile, or the lower petioled, oblong-lanceolate to spatulate, acute; heads 3″–4″ high, in a narrow, dense or interrupted, rarely branched thyrsus which is often 10′ long; bracts of the involucre obtuse or acute; achenes more or less pubescent.

Maine, New Hampshire, Vermont and northern New York, mostly at middle altitudes. Also in Europe. Called also Aaron's-rod, Woundwort. Aug.-Sept.

Solidago Virgàurea Rándii Porter, Bull. Torr. Club, 20: 208. 1893.

More or less glutinous; stem stout, often dark purple; heads in a large paniculately branched thyrsus. Maine, New Hampshire and Vermont.

Solidago Virgàurea Dèanei Porter, Mem. Torr. Club, 5: 320. 1894.
Solidago Virgaurea var. *monticola* Porter, Bull. Torr. Club, 20: 209. 1893. Not *S. monticola* T. & G. 1841.

Stem only 3′–12′ high, often slender; thyrsus short, 2′–4′ long; heads 1½″–3″ high. Mountains, Maine, Vermont and New Hampshire.

Solidago Virgàurea Redfièldii Porter, Bull. Torr. Club, 20: 209. 1893.

Very glutinous; stem 1°–1½° high; leaves thick; thyrsus paniculately branched, large, the strict branches erect-ascending. Mt. Desert Island, Maine, and Indian Pass, Adirondacks, N. Y.

Solidago Virgàurea Gillmani (A. Gray) Porter, Bull. Torr. Club, 20: 209. 1893.
Solidago humilis var. *Gillmani* A. Gray, Proc. Am. Acad. 17: 191. 1882.
Stout, 1½°–3° high; thyrsus paniculately branched; basal leaves very large, sometimes 10′ long, sharply serrate. Sand hills, southern shore of Lake Superior. Perhaps not referable to this species.

21. Solidago odòra Ait. Sweet or Anise-scented Golden-rod. (Fig. 3691.)

Solidago odora Ait. Hort. Kew. 3: 214. 1789.

Slender; stem simple, glabrous, or minutely pubescent above, 2°–4° high. Leaves punctate, anise-scented when bruised, lanceolate, quite entire, acute or acuminate, 2′–4′ long, 3″–8″ wide, sessile, or the lowermost petioled; heads 2″–2½″ high, secund on the spreading racemes of the terminal, usually ample panicle; rays 3 or 4, 2″–3″ long; bracts of the involucre oblong-lanceolate, acute.

In dry soil, Nova Scotia (according to Sommers); Massachusetts to Florida, west to New York, Kentucky and Texas. Called also Blue Mountain Tea. July–Sept.

20. Solidago sempérvirens L. Sea-side Golden-rod. (Fig. 3690.)

Solidago sempervirens L. Sp. Pl. 878. 1753.

Stem stout, leafy, usually simple, 2°–8° high, glabrous, or slightly puberulent above. Leaves thick, fleshy, entire, with 2–5 pairs of lateral veins, the lower and basal ones oblong, spatulate or lanceolate, mostly obtuse, sometimes 1° long, narrowed into long petioles; upper leaves sessile, lanceolate to oblong-lanceolate, acute; heads 3″–5″ high in secund racemes of a large terminal often leafy panicle; rays 8–10, showy; bracts of the involucre lanceolate, acute.

On salt marshes, sea-beaches, along tidal rivers and in sandy soil near the sea, New Brunswick to Florida and Mexico. Also in Bermuda. Called also Salt-marsh Golden-rod. Aug.–Dec.

Solidago odòra inodòra A. Gray, Man. Ed. 5, 244. 1867.

Leaves not punctate, scentless when bruised. Probably a mere form.

22. Solidago tortifòlia Ell. Twisted-leaf Golden-rod. (Fig. 3692.)

Solidago retrorsa Pursh, Fl. Am. Sept. 539. 1814. Not Michx. 1803.
Solidago tortifolia Ell. Bot. S. C. & Ga. 2: 377. 1824.

Stem slender, rough-pubescent or puberulent, 2°–3° high, simple. Leaves linear or linear-oblong, often twisted, scabrous, sessile, acute, 1′–2′ long, 1½″–3″ wide, obscurely veined but with a distinct midrib, the lower serrate, the upper entire; heads about 2″ high, secund on the usually recurved branches of the terminal panicle; rays 3–5, short; bracts of the involucre linear, obtuse or obtusish.

In dry sandy soil, Virginia to Florida and Texas, mostly near the coast. Autumn.

23. Solidago rugòsa Mill. Wrinkle-leaved, or Tall Hairy Golden-rod. Bitter-weed. (Fig. 3693.)

S. rugosa Mill. Gard. Dict. Ed. 8, No. 25. 1768.
Solidago altissima Ait. Hort. Kew. 3: 212. 1789.

Stem hirsute, usually stout, 1°–7½° high, simple, or branched at the summit. Leaves rather thin, more or less pubescent or scabrous, oval or oblong-lanceolate, acute or acuminate (rarely obtusish) at the apex, narrowed at the base, rugosely veined on the lower surface, sharply serrate, 1′–4′ long, 4″–18″ wide, sessile, or the lowest sometimes tapering into petioles; heads 1½″–2″ high, secund on the spreading or recurving, often leafy branches of the usually large and compound panicle; bracts of the involucre linear, obtuse or obtusish.

Usually in dry soil, in fields and along roadsides, Newfoundland to western Ontario, south to Florida and Texas. Very variable. July–Nov.

24. Solidago fistulòsa Mill. Pine Barren Golden-rod. (Fig. 3694.)

Solidago fistulosa Mill. Gard. Dict. Ed. 8, No. 19. 1768.
Solidago pilosa Walt. Fl. Car. 207. 1788. Not Mill. 1768.

Stem rather stout, simple, or branched above, 3°–7° high, hirsute. Leaves numerous, sessile, ovate-oblong, oblong-lanceolate, or sometimes lanceolate, thick, rough or hirsute on the margins and mid-rib beneath, the upper small, obtuse or obtusish, entire, the lower sparingly serrate, obtuse or acute, 1′–4′ long with a broad base; heads about 2″ high, secund on the spreading or recurving branches of the panicle; rays 7–10, small; bracts of the involucre, at least the outer, acute.

In moist pine-barrens, New Jersey to Florida and Louisiana. Aug.–Oct.

25. Solidago pátula Muhl. Rough-leaved or Spreading Golden-rod. (Fig. 3695.)

Solidago patula Muhl.; Willd. Sp. Pl. 3: 2059. 1804.

Stem stout, rather rigid, usually simple, glabrous, or sometimes puberulent above, 2°–7° high. Leaves thick, glabrous below, exceedingly rough above, pinnately veined, the lower and basal ones very large, 3′–16′ long, 1½′–5′ wide, oval or elliptic, narrowed into margined petioles, the upper smaller, oval or oblong, sessile, acute, finely serrate, or the uppermost entire; heads 3″–4″ high, secund on the widely spreading and recurving branches of the loose panicle; rays small; bracts of the involucre linear-oblong, obtuse.

In swamps, Maine and Ontario to Minnesota, south to Georgia, Missouri and Texas. Ascends to 5000 ft. in North Carolina. Stem strongly angled, at least below. Aug.–Oct.

26. Solidago ulmifòlia Muhl. Elm-leaved Golden-rod. (Fig. 3696.)

Solidago ulmifolia Muhl.; Willd. Sp. Pl. 3: 2060. 1804.

Stem slender, glabrous, or puberulent at the summit, 2°–4° high, simple, or branched above, the arched branches puberulent or pubescent. Leaves thin, oblong, acute or acuminate at the apex and base, coarsely and sharply serrate, pinnately veined, glabrous or sparingly pubescent, the lower and basal ones wider, 3′–5′ long, 1′–1½′ wide, narrowed into margined petioles, the upper smaller, sessile; heads 2″–3″ high, secund on the usually few and elongated, usually leafy racemose branches of the panicle; rays small, deep yellow; bracts of the involucre oblong-lanceolate, obtusish.

In woods and copses, Maine to Georgia, west to Minnesota, Missouri and Texas. Ascends to 2100 ft. in Virginia. July–Sept.

27. Solidago Boòttii Hook. Boott's Golden-rod. (Fig. 3697.)

S. Boottii Hook. Comp. Bot. Mag. 1: 97. 1835.

Stem glabrous, or puberulent above, slender, usually branched near the summit, 2°–5° high. Leaves firm, pinnately and finely reticulate-veined, the lower and basal ones ovate or oblong-lanceolate, narrowed into margined, sometimes ciliate petioles, acuminate at the apex, sharply and rather coarsely serrate, 3′–6′ long, the upper smaller, entire, or finely serrate, sessile; heads 2″–3″ high, secund on the elongated, spreading or recurving branches of the usually ample panicle; rays few, small; bracts of the involucre linear-oblong, obtuse; achenes pubescent.

In dry woods, Virginia to Florida and Texas. Ascends to 3000 ft. in Virginia. July–Sept.

28. Solidago Ellióttii T. & G. Elliott's Golden-rod. (Fig. 3698.)

Solidago Elliottii T. & G. Fl. N.A. 2: 218. 1841.
Solidago elliptica Ell. Bot. S. C. & Ga. 2: 376. 1824. Not Ait. 1789.

Stem glabrous, or minutely puberulent above, stout, 3°–6° high, simple, or branched at the inflorescence. Leaves firm, oblong or oblong-lanceolate, rarely ovate-oblong, acute or acuminate, sessile by a broad base, or sometimes narrowed below, finely serrate, crenate-serrate, or the upper entire, rough on the margins, pinnately veined, glabrous on both sides, or puberulent on the veins beneath, 1′–5′ long, 4″–12″ wide; heads about 3″ high, more or less secund on the short, spreading or recurving branches of the narrow panicle; bracts of the involucre linear-oblong, obtuse; rays 6–12, short; achenes pubescent.

In swamps, Massachusetts to North Carolina and Georgia, mainly near the coast. Sept.-Oct.

29. Solidago neglécta T. & G. Swamp Golden-rod. (Fig. 3699.)

Solidago neglecta T. & G. Fl. N. A. 2: 213. 1841.
Solidago Terrae-Novae T. & G. loc. cit. 206. 1841?

Stem glabrous, or slightly rough above, simple, rather stout, 2°–4° high. Leaves firm, the basal and lower ones lanceolate or oblong-lanceolate, large, sometimes 12′ long, acute or obtusish, serrate or serrulate, tapering into margined petioles, rough on the margins; upper leaves smaller, lanceolate, acute, sessile, serrate or nearly entire; heads 2½″–3″ high, more or less secund on the short branches of the thyrsoid panicle; rays 3–8, small; bracts of the involucre linear-oblong, obtuse; achenes glabrous, or nearly so.

In swamps, New Brunswick to Wisconsin, south to Maryland and Illinois. Forms with the heads little secund resemble *S. uliginosa*. Aug.–Sept.

30. Solidago uniligulàta (DC.) Porter. Few-rayed Golden-rod. (Fig. 3700.)

Bigelovia (?) *uniligulata* DC. Prodr. 5: 329. 1836.
Solidago linoides T. & G. Fl. N. A. 2: 216. 1841. Not Soland.
Solidago neglecta var. *linoides* A. Gray, Syn. Fl. 1: Part 2. 154. 1884.
Solidago uniligulata Porter, Mem. Torr. Club, 5: 320. 1894.

Stem simple, slender, 1½°–2½° high, glabrous, or slightly pubescent above. Leaves firm, obscurely pinnately veined, lanceolate or oblong-lanceolate, finely and sharply serrate, acute or acuminate, the lower long-petioled, 4′–9′ long, 4″–9″ wide, the upper sessile, the uppermost very small and erect; heads about 2″ high, densely secund on the short spreading or recurving branches of the small naked panicle; rays 1–4; bracts of the involucre linear-oblong, obtuse; achenes glabrous.

In swamps, Maine to New York and New Jersey. Aug.–Sept.

31. Solidago júncea Ait. Early or Sharp-toothed Golden-rod. (Fig. 3701.)

Solidago juncea Ait. Hort. Kew. 3: 213. 1789.
Solidago arguta T. & G. Fl. N. A. 2: 214. 1841. Not Ait. 1789.

Stem glabrous, or very nearly so throughout, rigid, rather stout, simple, or branched at the inflorescence, 1½°–4° high. Leaves firm, glabrous, lanceolate or oval-lanceolate, acute or acuminate, serrate, serrulate, or nearly entire, the lower large, sometimes 12′ long and 2′ wide, long-petioled, the upper smaller, sessile; heads 1½″–2″ high, secund on the recurved branches of the usually ample spreading panicle; rays 7–12, small; bracts of the involucre oblong or ovate-oblong, obtuse or acute; achenes glabrous or sparingly pubescent.

In dry or rocky soil, New Brunswick to Hudson Bay and Manitoba, North Carolina and Missouri. One of the earliest flowering species. Called also Yellow-top, Plume Golden-rod. June–Nov.

Solidago júncea scabrélla (T. & G.) A. Gray, Syn. Fl. 2: Part 2, 155. 1884.
S. arguta var. *scabrella* T. & G. Fl. N. A. 2: 214. 1841.

Leaves rigid, scabrous, especially on the margins. Illinois to Wisconsin and Kentucky.

Solidago júncea ramôsa Porter and Britton, Bull. Torr. Club, 18: 368. 1891.

Much branched at the summit, the branches slender, erect, slightly curved, the heads in short small racemes. Maine to Western New Jersey, West Virginia and Ohio.

33. Solidago rupéstris Raf. Rock Golden-Rod. (Fig. 3703.)

Solidago rupestris Raf. Ann. Nat. 14. 1820.

Stem slender, glabrous, or minutely pubescent above, 2°–3° high. Leaves thin, triple-nerved, linear-lanceolate, 2′–5′ long, 3″–5″ wide, entire, or sparingly serrate with somewhat appressed teeth, acuminate at the apex, narrowed at the base, sessile, or the lowest petioled, glabrous; heads small, 1½″ high, secund on the short spreading branches of the small panicle; rays 4-6, short; bracts of the involucre thin, linear; achenes small, nearly glabrous.

Rocky banks of streams, Pennsylvania to West Virginia, Tennessee and Indiana. Aug.–Sept.

32. Solidago argùta Ait. Cut-leaved Golden-rod. (Fig. 3702.)

Solidago arguta Ait. Hort. Kew. 3: 213. 1789.
S. Muhlenbergii T. & G. Fl. N. A. 2: 214. 1841.

Stem simple, rather stout, glabrous, or sparingly pubescent above, 2°–4° high. Leaves thin, pinnately veined, the lower and basal ones broadly ovate or oval, short-acuminate, 3′–16′ long, 1′–5′ wide, narrowed into margined petioles, sharply and coarsely serrate; upper leaves sessile, ovate to oblong, acute or acuminate, more or less serrate, smaller; heads 2½″–3½″ high, secund on the lateral racemose branches of the terminal, often leafy panicle; rays 5-7, large; bracts of the involucre oblong, obtuse; achenes glabrous or nearly so.

In rich woods, Ontario and New England to Ohio, south to Virginia. Ascends to 2700 ft. in the Adirondacks. July–Oct.

34. Solidago serótina Ait. Late Golden-rod. (Fig. 3704.)

Solidago serotina Ait. Hort. Kew. 3: 211. 1789.
S. gigantea Willd. Sp. Pl. 3: 2056. 1804. Not Ait. 1789.

Stem stout, 3°–8° high, glabrous, sometimes glaucous. Leaves lanceolate or oblong-lanceolate, thin, triple-nerved, sharply serrate, or rarely nearly entire, sessile, or the lowest petioled, glabrous on both sides but more or less rough-margined, 3′–6′ long, 2″–12″ wide, acuminate at the apex, narrowed at the base; heads 2½″–3½″ high, crowded on the spreading or recurving branches of the usually large and often leafy panicle, which are sometimes puberulent; bracts of the involucre oblong, thin, obtuse; rays 7–15, rather large; achenes finely pubescent.

In moist soil, Newfoundland to British Columbia, south to Georgia, Texas, Nevada and Oregon. Ascends to 2300 ft. in Virginia. Aug.–Oct.

Solidago serótina gigantèa (Ait.) A. Gray, Proc. Am. Acad. 17: 180. 1882.

Solidago gigantea Ait. Hort. Kew. 3: 211. 1789.

Leaves hispid or pubescent on the lower surface, at least on its prominent veins. With the type.

35. Solidago Missouriénsis Nutt. Missouri Golden-rod. (Fig. 3705.)

Solidago Missouriensis Nutt. Journ. Acad. Phila. 7: 32. 1834.

Stem glabrous, rather slender, 3°–5° high. Leaves firm or thick, those of the stem linear-lanceolate and sessile, acuminate at the apex, narrowed at the base, 2′–4′ long, very rough-margined, triple-nerved, entire, or sparingly serrate with low sharp teeth, the basal and lowest ones larger, spatulate, petioled; heads 2½″–3″ high, secund on the spreading or recurving branches of the short and broad, usually naked panicle; bracts of the involucre oblong, greenish-tipped, obtuse, or the inner acute, thick; rays 6–13, short; achenes nearly glabrous.

On dry prairies, Manitoba and Minnesota to Tennessee, west to Nebraska, Washington, Missouri and Texas. Autumn.

36. Solidago Shórtii T. & G. Short's Golden-rod. (Fig. 3706.)

Solidago Shortii T. & G. Fl. N. A. 2: 222. 1841.

Stem slender, glabrous below, minutely pubescent above, 2°–4° high. Leaves firm, oblong-lanceolate, sessile (the lowest petioled?), triple-nerved, acute or acuminate at the apex, glabrous on both sides, the larger 2′–4′ long, 5″–6″ wide, sharply serrate with rather small and distant teeth, the upper gradually smaller, sparingly serrate, or entire; heads about 3″ high, secund on the usually recurved branches of the commonly large puberulent panicle; involucre narrowly campanulate, its bracts linear-oblong, obtuse; rays 5–7, rather small; achenes silky-pubescent.

On rocks at the Falls of the Ohio river and in northwestern Arkansas. July–Aug.

37. Solidago Gattiínger Chapm. Gattinger's Golden-rod. (Fig. 3707.)

Solidago Gattingeri Chapm.; A. Gray, Syn. Fl. 1: Part 2, 156. 1884.

Stem slender, 2°–3° high, branched at the inflorescence, glabrous throughout. Leaves firm, glabrous beneath, rough above, ciliolate, the lower and basal ones oblanceolate or spatulate, acutish, 3′–6′ long, 6″–10″ wide, serrate with low distant teeth, narrowed into margined petioles; upper leaves abruptly smaller, linear-oblong or oblanceolate, bract-like, entire, sessile; heads 2″–2½″ high, somewhat secund on the spreading, often very slender and elongated branches of the panicle; bracts of the involucre oblong, very obtuse; rays 6–10; achenes puberulent, or glabrous below.

In dry soil, Tennessee and Missouri. July–Aug.

38. Solidago Canadénsis L. Canada Golden-rod. (Fig. 3708.)

Solidago Canadensis L. Sp. Pl. 878. 1753.
Solidago altissima L. loc. cit. 1753.

Stem stout, puberulent, pubescent, or hirsute, 2°-8° high. Leaves lanceolate, triple-nerved, acute at each end, the lower oues sharply serrate and petioled, 3′–6′ long, 4″–12″ wide, the upper smaller, entire, sessile; heads 1½″–2″ high, very numerous, secund on the spreading or recurving branches of the usually large and dense panicle; bracts of the involucre linear, obtuse or acutish; rays 9–15; achenes glabrous or somewhat pubescent.

Usually in dry soil, New Brunswick to the Northwest Territory and British Columbia, south to Florida and Arizona. Called also Yellow weed. Aug.–Nov.

Solidago Canadénsis prócera (Ait.) T. & G. Fl. N. A. 2: 224. 1841.
S. procera Ait. Hort. Kew. 3: 211. 1789.

Leaves less serrate, sometimes all entire, cinereous-pubescent with short appressed hairs. With the type.

Solidago Canadénsis glabràta Porter, Bull. Torr. Club, 21: 310. 1894.

Stems 2°–4° high, glabrous or nearly so below, puberulent above; leaves narrowly lanceolate, smooth above, pubescent on the veins beneath; panicles and heads smaller than in the type. Maine to northern New York and Pennsylvania.

Solidago Canadénsis scabriúscula Porter, Mem. Torr. Club, 5: 318. 1894.
Solidago Canadensis var. *scabra* T. & G. Fl. N. A. 2: 224. 1841. Not *S. scabra* Willd. 1804.

Leaves shorter, sparingly serrate or entire, rough above, rugose beneath; heads mostly larger than in the type. New York and Pennsylvania to Florida and Texas.

Solidago Canadénsis gilvoscanéscens Rydberg, Contr. Nat. Herb. 3: 162. 1895.

A foot high, or less, leafy, canescent, yellowish; leaves remotely serrate above the middle, or entire; inflorescence dense; heads smaller than in the type. Minnesota to Montana and Kansas.

39. Solidago nemoràlis Ait. Gray or Field Golden-rod. Dyer's Weed. (Fig. 3709.)

Solidago nemoralis Ait. Hort. Kew. 3: 213. 1789.

Slender, ashy-gray, 6′–2° high, finely and densely pubescent. Leaves thick, roughish, the basal and the lower stem leaves oblanceolate or spatulate, petioled, obscurely triple-nerved, obtuse or acutish, crenate-dentate, 3′–6′ long, 4″–12″ wide; upper leaves gradually smaller, oblanceolate or linear-oblong, acute or acutish, entire; heads 2″–3″ high, secund on the spreading or recurving branches of the terminal, usually one-sided panicle; bracts of the involucre linear-oblong; rays 5–9; achenes pubescent.

In dry soil, Quebec to the Northwest Territory, Florida, Texas and Arizona. July–Nov.

Solidago nemoràlis arenícola Burgess

Depressed, or prostrate, about 6′ high; inflorescence dense, flattened, composing most of the plant. Sand hills, Cape Cod to Long Island.

40. Solidago móllis Bartl. Velvety Golden-rod. (Fig. 3710.)

Solidago mollis Bartl. Ind. Sem. Goett. 5. 1836.
Solidago incana T. & G. Fl. N. A. 2: 221. 1841.
Solidago nemoralis var. *incana* A. Gray, Proc. Am. Acad. 17: 197. 1882.

Stem rigid, stout, low, canescent or slightly scabrous, 6′–12′ high. Leaves pale, canescent or rough, entire or dentate, strongly 3-nerved, oblong, ovate or oblanceolate, the lower petioled, 2′–3′ long, 3″–12″ wide, very obtuse, the upper sessile, smaller; heads 2″–3″ high, somewhat or scarcely secund on the short branches of the erect, not one-sided, dense thyrsoid panicle; bracts of the involucre oblong, obtuse or acutish; rays 5–9; achenes pubescent.

Dry plains, Minnesota to the Northwest Territory, south to Texas and Mexico. July–Sept.

41. Solidago Rádula Nutt. Western Rough Golden-rod. (Fig. 3711.)

Solidago Radula Nutt. Journ. Acad. Phila. 7: 102. 1834.

Stem rough-pubescent, rather slender, 1°–3° high. Leaves thick, green, rough on both sides, the lower oblanceolate or spatulate, dentate-crenate, obtuse or acutish, petioled, 3′–8′ long, 6″–20″ wide, obscurely 3-nerved, the upper smaller, oblanceolate, entire or nearly so, sessile, distinctly 3-nerved, the uppermost very small; heads 2″–3″ high, secund on the short, usually somewhat recurved branches of the dense, often one-sided panicle; bracts of the involucre oblong or linear-oblong, obtuse; rays 3–7, very short; achenes minutely pubescent.

In dry soil, Illinois to Missouri, Louisiana and Texas. Aug.–Sept.

42. Solidago Drummóndii T. & G. Drummond's Golden-rod. (Fig. 3712.)

Solidago Drummondii T. & G. Fl. N. A. 2: 217. 1841.

Stem rather slender, 1°–3° high, finely soft-pubescent. Leaves rather thin, broadly ovate or oval, glabrous or nearly so above, finely, but sometimes sparingly pubescent, or roughish beneath, sharply serrate, acute at the apex, narrowed at the base, 3-nerved and pinnately veined, petioled, or the upper sessile, the larger 3′–4′ long, 1½′–2′ wide; heads 2″–2½″ high, secund on the usually few, spreading or recurving branches of the panicle; bract-like upper leaves obtuse, or acute, entire; rays 4–6, conspicuous; bracts of the involucre oblong-lanceolate, obtuse; achenes pubescent.

In rocky soil, Illinois to Louisiana and Missouri. Sept.–Oct.

43. Solidago rígida L. Stiff or Hard-leaved Golden-rod. (Fig. 3713.)

Solidago rigida L. Sp. Pl. 880. 1753.

Stem stout, simple, or branched above, densely and finely rough-pubescent, hoary, 1°–5° high. Leaves thick, rigid, ovate to oblong, pinnately veined, often obtuse, rough on both sides, the upper sessile, clasping, and rounded or sometimes narrowed at the base, 1′–2′ long, mostly entire; lower and basal leaves long-petioled, sometimes 1° long and 3′ wide, entire or serrulate; heads 4″–5″ high, many-flowered, in a terminal dense corymbose cyme, the clusters sometimes slightly secund; involucre broadly campanulate, its bracts oblong, obtuse, the outer pubescent; rays 6–10, large; achenes glabrous, 10–15-nerved.

In dry sandy, gravelly or rocky soil, Ontario to the Northwest Territory, south to Georgia, Texas and Colorado. Aug.–Oct.

44. Solidago multiradiàta Ait. Northern Golden-rod. (Fig. 3714.)

Solidago multiradiata Ait. Hort. Kew. 3: 218. 1789.

Stem glabrous or somewhat pubescent above, rather slender, 6′–15′ high. Leaves firm, glabrous or very nearly so, the basal and lower ones spatulate or oblanceolate, entire, or sparingly serrate, obtuse, finely reticulate-veined, 3′–5′ long, 3″–9″ wide, the upper smaller, narrower, sessile, entire; heads about 4″ high, usually few in a terminal rather compact, corymbose cyme, but the inflorescence sometimes elongated and thyrsoid; bracts of the involucre thin, linear-lanceolate, acute; glabrous; rays 8–15, prominent, linear, achenes pubescent.

Labrador and Hudson Bay to British Columbia, south in the Rocky Mountains to Colorado. July–Aug.

45. Solidago Ohioénsis Riddell. Ohio Golden-rod. (Fig. 3715.)

Solidago Ohioensis Riddell, Syn. Fl. West. States, 57. 1835.

Very smooth throughout; stem rather slender, simple, 2°–3° high. Leaves firm, the basal and lower ones elongated-lanceolate or oblong-lanceolate, obtuse, long-petioled, serrulate toward the end, or sometimes entire, often 1° long; upper leaves sessile, lanceolate, entire, gradually smaller and those of the inflorescence bract-like; heads 2½″–3″ high, numerous in a terminal compound cyme, 15–25-flowered; rays 6–9, small; bracts of the narrowly campanulate involucre oblong, very obtuse, glabrous; achenes glabrous, 5-nerved.

In moist soil, western New York to Illinois. Aug.–Sept.

46. Solidago Riddéllii Frank. Riddell's Golden-rod. (Fig. 3716.)

Solidago Riddellii Frank; Riddell, Syn. Fl. West. States, 57. 1835.

Stem stout, glabrous, or slightly pubescent above, 1°–3° high. Leaves numerous, thick, glabrous on both sides, entire, acute at each end, the lower and basal ones long-petioled, elongated, lanceolate, somewhat triple-nerved, often 1° long, 4″–10″ wide, the upper smaller, similar, sessile and clasping at the base, conduplicate, somewhat falcate; heads 3″–4″ high, 20–30-flowered, very numerous in a dense corymbose cyme; involucre oblong-campanulate, its bracts broadly oblong, obtuse; rays 7–9, narrow; achenes 5-nerved, glabrous.

On moist prairies, Ohio to Minnesota and Missouri. Also at Fortress Monroe, Va. Aug.–Sept.

47. Solidago Houghtonii T. & G. Houghton's Golden-rod. (Fig. 3717.)

Solidago Houghtonii T. & G.; A. Gray, Man. 211. 1848.

Stem slender, glabrous below, sparingly pubescent above, 1°–2° high. Leaves linear, the basal and lower ones petioled, 4′–5′ long, 2″–4″ wide, 3-nerved, entire, acute at each end, the upper smaller, sessile, slightly conduplicate, otherwise similar, the uppermost small and bract-like; heads about 3″ high, few, in a small corymbose cyme, 20–30-flowered; involucre broadly campanulate, its bracts oblong, obtuse; achenes glabrous, 4–5-nerved.

In swamps, north shores of Lakes Superior and Huron, and in Genesee Co., N. Y. Autumn.

23. EUTHÀMIA Nutt. Gen. 2: 162. 1818.

Erect, paniculately-branched herbs, perennial by long rootstocks, with linear or lincar-lanceolate entire sessile 1–5-nerved punctate leaves, and very numerous small heads of both tubular and radiate yellow flowers, clustered in the large cymose, convex or nearly flat-topped inflorescence. Bracts of the involucre obtuse, imbricated in several series, appressed, somewhat glutinous. Receptacle flattish, fimbrillate, or pilose. Ray-flowers pistillate, usually more numerous than the disk-flowers, the rays small. Disk-flowers perfect. Anthers obtuse at the base. Style-branches with lanceolate appendages. Achenes top-shaped or oblong, villous-pubescent. [Greek, referring to the clustered heads.]

Four known species, the following, and one of western North America.

Leaves distinctly 3–5-nerved; ray-flowers 12–20.	1. *E. graminifolia.*
Leaves 1-nerved, or with a pair of indistinct lateral nerves; ray-flowers 5–10.	
Stem-leaves 2″–3″ wide; disk-flowers 3 or 4.	2. *E. leptocephala.*
Leaves ½″–1½″ wide; disk-flowers 5 or 6.	3. *E. Caroliniana.*

1. Euthamia graminifòlia (L.) Nutt. Bushy or Fragrant Golden-rod. (Fig. 3718.)

Chrysocoma graminifolia L. Sp. Pl. 841. 1753.
Solidago lanceolata L. Mant. 114. 1767.
Euthamia graminifolia Nutt. Gen. 2: 162. 1818.
Solidago graminifolia Ell. Bot. S. C. & Ga. 2: 391. 1824.

Stem paniculately much branched, or rarely simple, glabrous but sometimes slightly rough above, 2°–4° high. Leaves numerous, linear-lanceolate, acuminate or acute at each end, 1′–5′ long, 2″–4″ wide, 3–5-nerved, minutely rough-pubescent on the margins and nerves of the lower surface; resinous dots few; heads 2″–3″ high, sessile in capitate clusters arranged in a flat-topped corymbose cyme; involucre ovoid-campanulate, its bracts oblong or oblong-lanceolate, slightly viscid; rays 12–20; disk-flowers 8–12.

In moist soil, fields and roadsides, New Brunswick to the Northwest Territory, south to Florida, Nebraska and Missouri. Fragrant. July–Sept.

2. Euthamia leptocéphala (T. & G.) Greene. Western Bushy Golden-rod. (Fig. 3719.)

Solidago leptocephala T. & G. Fl. N. A. 2: 226. 1841.

Euthamia leptocephala Greene, Mem. Torr. Club, 5: 321. 1894.

Stem much branched, smooth, 1½°–2½° high. Leaves linear to linear-lanceolate, acuminate or acute at each end, 1-nerved, or with a pair of indistinct lateral nerves, rough-margined, those of the stem usually 2′–3′ long, 2″–3″ wide; heads 2″–3″ high, rather narrower than those of the preceding species, sessile in the clusters of the flat-topped inflorescence; bracts of the involucre linear-oblong; disk-flowers 3 or 4; ray-flowers 7–10.

In moist soil, Missouri to Louisiana and Texas. Aug.–Oct.

3. Euthamia Caroliniàna (L.) Greene. Slender Fragrant Golden-rod. (Fig. 3720.)

Erigeron Carolinianum L. Sp. Pl. 863. 1753.

Solidago tenuifolia Pursh, Fl. Am. Sept. 540. 1814.

Euthamia Caroliniana Greene, Mem. Torr. Club, 5: 321. 1894.

Resembles the preceding species but is smaller, glabrous and somewhat resinous, seldom over 1½° high. Leaves narrowly linear, entire, acuminate, sessile, narrowed at the base, 1-nerved or with an additional pair of faint lateral nerves, 1′–3′ long, 1″–2″ wide, punctate, often with smaller ones clustered in the axils, the resinous dots minute; heads about 1½″ high, very numerous and crowded in the dense corymbose cyme; involucre oblong-campanulate, its bracts oblong; rays 6–12; disk-flowers 4–6.

In dry sandy soil, eastern Massachusetts to Illinois, Florida, Louisiana and Texas, mainly near the coast. Aug.–Oct.

24. BRACHYCHAÈTA T. & G. Fl. N. A. 2: 194. 1841.

An erect, perennial herb, with the aspect of a Golden-rod. Leaves alternate, the lower and basal ones large, cordate, long-petioled, the upper ovate, short-petioled or sessile. Heads composed of both tubular and radiate flowers, in a terminal narrow spike-like thyrsus. Involucre narrowly campanulate, its bracts coriaceous, imbricated in few series, the outer successively smaller. Receptacle small, naked. Rays small, yellow, pistillate. Disk-flowers perfect, their corollas tubular, somewhat expanded above, 5-cleft. Anthers obtuse and entire at the base. Style-branches flattened, their appendages lanceolate. Achenes 8–10-ribbed. Pappus a single row of scale-like bristles, shorter than the achene. [Greek, short-bristle, referring to the pappus.]

A monotypic genus of eastern North America.

1. **Brachychaeta sphacelàta** (Raf.) Britton. False Golden-rod. (Fig. 3721.)

Solidago sphacelata Raf. Ann. Nat. 14. 1820.
S. cordata Short, Trans. Journ. Med. 7: 599. 1834.
Brachychaeta cordata T. & G. Fl. N. A. 2: 194. 1841.
B. sphacelata Britton; Kearney, Bull. Torr. Club, 20: 484. 1893.

Stem erect, pubescent, simple, or branched above, 2°–4° high. Basal and lower leaves broadly ovate, cordate or truncate at the base, acute at the apex, pinnately veined, sharply serrate, 3′–6′ long, the slender petioles 3′–9′ long, stem leaves gradually smaller and shorter-petioled, the uppermost very small and sessile; heads about 2½″ high, racemose-secund or densely clustered on the short branches of the narrow elongated terminal thyrsus; bracts of the involucre oblong or linear-oblong, obtuse or acutish; rays and disk-flowers each about 5.

In dry woods, western Virginia to Indiana, south to North Carolina and Georgia. Aug.–Sept.

25. APHANÓSTEPHUS DC. Prodr. 5: 310. 1836.

Erect or ascending canescent branching herbs, with alternate leaves, and rather large heads of both tubular and radiate flowers, solitary at the ends of the branches. Involucre hemispheric, its bracts lanceolate or linear, scarious-margined, imbricated in a few series, the outer smaller. Receptacle convex or conic, naked. Ray-flowers pistillate, white or purplish. Disk-flowers perfect, yellow, their corollas tubular, the limb expanded above, 5-dentate. Anthers obtuse and entire at the base. Style-branches flattened, their appendages short, obtuse. Achenes many-ribbed. Pappus a short dentate crown. [Greek, faint-crown.]

About 5 species, natives of the southwestern United States and Mexico.

1. **Aphanostephus skirróbasis** (DC.) Trelease. Aphanostephus (Fig. 3722.)

Keerlia skirrobasis DC. Prodr. 5: 310. 1836.
Leucopsidium Arkansanum DC. Prodr. 6: 43. 1837.
Aphanostephus Arkansanus A. Gray, Pl. Wright. 1: 93. 1852.
Aphanostephus skirrobasis Trelease; Coville & Branner, Rep. Geol. Surv. Ark. 1884: Part 4, 191. 1891.

Erect, or diffusely branched, densely canescent, 6′–2° high. Basal and lower leaves spatulate, obtuse, 1′–4′ long, somewhat dentate, laciniate or entire, narrowed into margined petioles; upper leaves lanceolate, oblong or oblanceolate, obtuse or acute, mostly sessile, smaller; heads 8″–12″ broad, 3″–5″ high; rays numerous, narrow, entire; achenes ribbed and angled; pappus a lobed or dentate crown.

In dry soil, Kansas to Texas. Also in Florida. May–Aug.

26. BÉLLIS L. Sp. Pl. 886. 1753.

Tufted herbs, with branching or scapose stems, alternate or basal leaves, and rather large heads of both tubular and radiate flowers, solitary at the ends of the branches, or of the monocephalous scape. Involucre hemispheric or broadly campanulate, its bracts herbaceous, imbricated in 1 or 2 series, nearly equal. Receptacle convex or conic, naked. Ray-flowers white or pink, pistillate. Disk-flowers yellow, perfect, their corollas tubular, the limb 4–5-toothed. Anthers obtuse and entire at the base. Style-branches flattened, their appendages short, triangular. Achenes flattened, nerved near the margins. Pappus none, or a ring of minute bristles. [Latin, pretty.]

About 9 species, natives of the northern hemisphere. Only the following are known to occur in North America, but 2 others are found in Mexico.

Stem branched, 6′–15′ high; involucral bracts acute. 1. *B. integrifolia.*
Scapes monocephalous, 1′–7′ high; involucral bracts obtuse. 2. *B. perennis.*

1. Bellis integrifòlia Michx. Western Daisy. (Fig. 3723.)

Bellis integrifolia Michx. Fl. Bor. Am. 2: 131. 1803.

Slender, diffusely branched, pubescent, 6′–15′ high. Leaves thin, entire, obtuse, the lower and basal ones spatulate, 1′–3′ long, narrowed into margined petioles, the upper smaller, oblong, oblanceolate or linear; heads 6″–15″ broad; bracts of the involucre acute or acuminate, scarious-margined, glabrous or nearly so; rays usually violet, oblong-linear; peduncles terminating the branches, 2′–7′ long.

In moist soil, Kentucky and Tennessee to Arkansas and Texas. May–July.

2. Bellis perénnis L. European or Garden Daisy. (Fig. 3724.)

Bellis perennis L. Sp. Pl. 886. 1753.

Perennial, tufted. Leaves all basal, obovate, obtuse, slightly dentate, 1′–2′ long, narrowed into margined petioles, pubescent and ciliate; scapes naked, 1′–7′ high, usually several from the same root, pubescent; heads 6″–12″ broad; rays numerous, linear, white, pink, or purple; bracts of the involucre oblong, obtuse, usually purple.

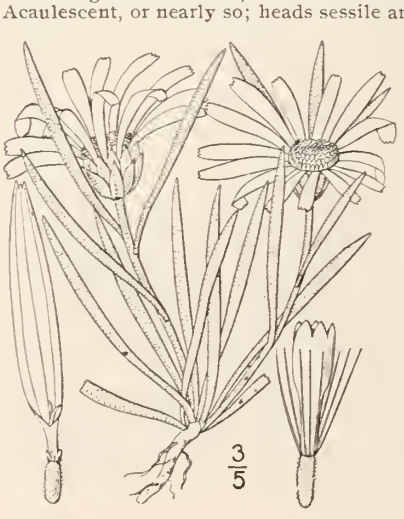
In waste places, or occasionally spontaneous on lawns, southern New York and eastern Pennsylvania to Nova Scotia and Ontario. Fugitive from Europe. Native also of Asia. Naturalized in California and British Columbia. Other English names are Herb Margaret, Ewe- or May-gowan, Childing Daisy, Bone- or Bruise-wort, Bone-flower, March Daisy, Bairn-wort. April–Nov.

27. TOWNSÉNDIA Hook. Fl. Bor. Am. 2: 16. 1834.

Tufted scapose or branching herbs, with alternate entire linear or spatulate leaves, and large heads of both tubular and radiate flowers. Involucre hemispheric or broadly campanulate; bracts imbricated in several series, the outer shorter. Receptacle nearly flat, naked or fimbrillate. Ray-flowers pink or white, pistillate. Disk-flowers tubular, mostly perfect, their corollas regular, 5-lobed. Anthers obtuse and entire at the base. Style-branches flattened, their appendages lanceolate. Achenes of the disk-flowers compressed, those of the rays commonly 3-angled. Pappus a single series of rigid bristles or short scales. [Named for David Townsend, botanist, of Philadelphia.]

About 17 species, natives of western North America.

Branching from the base; heads terminal. 1. *T. grandiflora.*
Acaulescent, or nearly so; heads sessile among the leaves. 2. *T. exscapa.*



1. Townsendia grandiflòra Nutt. Large-flowered Townsendia. (Fig. 3725.)

Townsendia grandiflora Nutt. Trans. Am. Phil. Soc. (II) 7: 306. 1841.

Perennial from a long woody root, branching at the base and sometimes also above, pubescent, or at length glabrate, 2′–8′ high. Leaves linear or linear-spatulate, 1′–3′ long, 1½″–3″ wide, canescent; heads 1′–1½′ broad, solitary at the ends of the branches; involucre hemispheric, its bracts scarious-margined, lanceolate, conspicuously acuminate; rays violet or purple; pappus of the ray-flowers a crown of short scales, that of the disk-flowers of rigid bristles longer than the achene, which is pubescent with 2-toothed hairs.

In dry soil, western Nebraska to Wyoming and New Mexico. May–Aug.

2. Townsendia exscàpa (Richards) Porter. Silky or Low Townsendia. (Fig. 3726.)

Aster (?) *exscapus* Richards. App. Frank. Journ. 32. 1823.
Townsendia sericea Hook. Fl. Bor. Am. 2: 16. *pl. 119.* 1834.
Townsendia exscapa Porter, Mem. Torr. Club, 5: 321. 1894.

Acaulescent, or nearly so, from a deep woody root, tufted, 1′–3′ high. Leaves all clustered at the base, narrowly linear or slightly spatulate, 1′–2′ long, 1″–2½″ wide; heads closely sessile, 1′–1½′ broad, equalled or surpassed by the leaves; involucre broadly campanulate, its bracts lanceolate, acute, the inner scarious-margined; rays white or purplish; pappus of both ray and disk-flowers a row of rigid bristles, those of the rays shorter and smaller.

In dry soil, Northwest Territory to Nebraska, Arizona and New Mexico. Often silky-pubescent. April–July.

28. CHAETOPÁPPA DC. Prodr. 5: 301. 1836.

Annual slender much branched herbs, with small alternate entire leaves, and small long-peduncled heads of both tubular and radiate flowers. Involucre narrowly campanulate, its bracts lanceolate, acute or acuminate, imbricated in few series, the outer slightly shorter. Receptacle small, naked. Ray-flowers in 1 row, pistillate. Disk-flowers perfect, or the central ones staminate, their corollas 5-lobed. Anthers obtuse and entire at the base. Style-branches narrow, flattened, their appendages short, obtuse. Achenes nearly terete, fusiform, or linear, 5-ribbed. Pappus usually of 5 rigid awn-like scabrous bristles, alternating with as many short scales or more. [Greek, bristle-pappus.]

Two known species, natives of the southwestern United States. The genus *Distasis* DC. (*Chaetopappa modesta* A. Gray), is here regarded as distinct.

1. Chaetopappa asteroides DC. Chaetopappa. (Fig. 3727.)

Chaetopappa asteroides DC. Prodr. 5: 301. 1836.

Annual, pubescent, erect, 2′–12′ high, the branches filiform. Lower and basal leaves spatulate, obtuse, ½′–1′ long, petioled, the upper linear, much smaller and bract-like, sessile; heads about 3″ broad; involucre about 2″ high, its bracts scarious-margined, glabrous or nearly so; rays 5–12, raised on slender tubes; central sterile flowers usually awnless; shorter scales of the pappus of the fertile flowers hyaline, sometimes lacerate.

In dry soil, Missouri to Texas and northern Mexico. April–July.

29. BOLTÒNIA L'Her. Sert. Angl. 27. 1788.

Perennial glabrous branching herbs, with striate or angled stems, alternate entire sessile or clasping leaves, and numerous rather large heads of both tubular and radiate flowers, paniculate, or solitary at the ends of the branches. Involucre hemispheric or broadly campanulate, its bracts scarious-margined, imbricated in few series, the outer slightly shorter. Receptacle convex or conic, foveolate. Ray-flowers pistillate. Disk-flowers perfect, their corollas elongated, 5-lobed. Anthers obtuse and entire at the base. Style-branches flattened, their appendages short, lanceolate. Achenes flattened, obovate, their margins thickened or narrowly winged, glabrous or nearly so. Pappus a series of short scales, usually with 2–4 slender rigid bristles. [Named for James Bolton, an English botanist of the 18th century.]

As here limited, the genus consists of the 4 following species, with perhaps a fifth in Oregon.

Disk about 2″ broad; leaves linear. 1. *B. diffusa.*
Disk 3″–6″ broad; leaves lanceolate.
Leaves narrowed at the base, sessile, not decurrent on the stem.
Involucre-bracts lanceolate, acute. 2. *B. asteroides.*
Involucre-bracts spatulate, obtuse, or mucronate. 3. *B. latisquama.*
Stem leaves, and sometimes those of the branches decurrent, sagittate. 4. *B. decurrens.*

1. Boltonia diffùsa Ell. Panicled Boltonia. (Fig. 3728.)

Boltonia diffusa Ell. Bot. S. C. & Ga. 2: 400. 1824.

Paniculately much branched, 2°–7° high, the branches very slender or filiform. Leaves linear, or the lower linear-lanceolate, acutish, the larger 1′–2′ long, 1½″–2″ wide, those of the branches very small and subulate; heads about 2″ high; disk about 2″ broad; rays usually white, 1″–2″ long; involucre broadly campanulate, its bracts oblong or oblong-lanceolate, acutish or obtuse; achenes obovate, narrowly winged; pappus of several short scales and 2 subulate bristles shorter than the achene.

In dry soil, southern Illinois to Texas, east to South Carolina and Florida. Aug.–Oct.

2. Boltonia asteroìdes (L.) L'Her. Aster-like Boltonia. (Fig. 3729.)

Matricaria asteroides L. Mant. 116. 1767.
Matricaria glastifolia Hill, Hort. Kew. 19. *pl. 3.* 1769.
Boltonia asteroides L'Her. Sert. Angl. 27. 1788.

Rather stout, 2°–8° high, somewhat cymosely paniculate. Leaves lanceolate, to oblanceolate, sessile, 2′–5′ long, 3″–12″ wide, the upper linear-lanceolate, smaller; heads 2″–4″ high; disk 3″–6″ wide; rays white, pink or purple, 3″–6″ long; involucre hemispheric, its bracts lanceolate or oblong-lanceolate, acute or acuminate; pappus of setose scales, with or without 2–4 slender bristles nearly as long as the obovate or oval achene.

In moist soil, New Jersey to Florida, west to Minnesota, Nebraska and Louisiana. July–Sept.

3. Boltonia latisquàma A. Gray. Broad-scaled Boltonia. (Fig. 3730.)

Boltonia latisquama A. Gray, Am. Journ. Sci. (II) 33: 238. 1862.

Similar to the preceding species and perhaps a variety or form of it. Leaves lanceolate, acute, sessile; heads rather larger; rays blue-violet; bracts of the involucre oblong-spatulate, obtuse or mucronate; pappus of numerous small short broad scales and 2 long bristles.

Western Missouri, eastern Kansas and Arkansas. Autumn.

4. Boltonia decúrrens (T. & G.) Wood. Clasping-leaved Boltonia. (Fig. 3731.)

Boltonia glastifolia var. (?) *decurrens* T. & G. Fl. N. A. 2: 188. 1841.

Boltonia decurrens Wood, Bot. & Flor. 166. 1870.

Boltonia asteroides var. *decurrens* Engelm.; A Gray, Syn. Fl. 1: Part 2, 166. 1884.

Stout, 3°–6° high, branched above. Leaves oblong-lanceolate or elongated lanceolate, mucronate at the apex, those of the stem decurrent and sagittate at the base, 3′–6′ long, 6″–8″ wide, those of the branches smaller and merely sessile or some of them also decurrent; heads 2½″–3″ high; involucre hemispheric; rays about 3″ long, violet or purple; pappus of several or numerous short scales and 2 very slender bristles.

In wet prairies, Illinois and Missouri. Aug.–Sept.

30. SERICOCÀRPUS Nees, Gen. & Sp. Ast. 148. 1833.

Erect perennial herbs, with alternate leaves, and middle-sized heads of both tubular and radiate flowers, in terminal cymose panicles. Involucre ovoid, oblong, or campanulate, its bracts coriaceous, with herbaceous or squarrose tips, imbricated in several series, the outer shorter. Receptacle small, foveolate. Ray-flowers white, pistillate. Disk-flowers mostly perfect, their corollas tubular, narrow, yellowish or purplish, 5-lobed. Anthers obtuse and entire at the base. Style-branches with lanceolate-subulate appendages. Achenes slightly compressed, linear-oblong, 1-nerved on each side, pubescent. Pappus of numerous capillary scabrous bristles, the outer usually shorter. [Greek, silky fruit, referring to the achenes.]

Four known species, natives of North America. Besides the following, another occurs on the northwestern coast of North America.

Leaves entire, linear, spatulate, or obovate, rigid.
- Glabrous, or nearly so; leaves linear or linear-spatulate. — 1. *S. linifolius.*
- Puberulent or scabrous; leaves obovate. — 2. *S. bifoliatus.*

Leaves dentate, oblong, or obovate, thin. — 3. *S. asteroides.*

1. Sericocarpus linifòlius (L.) B.S.P. Narrow-leaved White-topped Aster. (Fig. 3732.)

Conyza linifolia L. Sp. Pl. 861. 1753.

Sericocarpus solidagineus Nees, Gen. & Sp. Ast. 149. 1832.

Sericocarpus linifolius B.S.P. Prel. Cat. N. Y. 26. 1888.

Glabrous or very nearly so throughout; stem rather slender, striate, 1°–2½° high. Leaves linear or linear-spatulate, spreading, faintly 3-nerved, thick, entire, obtuse at the apex, narrowed at the base, 1′–2′ long, 1½″–3″ wide, sessile, or the lowest on short margined petioles, their margins scabrous; heads about 3″–4″ high, clustered in 2's–6's at the ends of the cymose branches; involucre oblong-campanulate, its bracts oblong, obtuse, the outer with somewhat spreading or reflexed green tips, the inner scarious and often lacerate or ciliate at the apex; rays 4 or 5, about 4″–5″ long; pappus white.

In dry, usually sandy soil, Canada (according to Gray), Vermont to Ohio, Georgia and Louisiana. June–Sept.

2. Sericocarpus bifoliàtus (Walt.) Porter. Rough White-topped Aster. (Fig. 3733.)

Conyza bifoliata Walt. Fl. Car. 204. 1788.
Aster tortifolius Michx. Fl. Bor. Am. 2: 109. 1803.
S. tortifolius Nees, Gen. & Sp. Ast. 151. 1832.
S. bifoliatus Porter, Mem. Torr. Club, 5: 322. 1894.

Densely puberulent or scabrous, about 2° high, the stem terete, or slightly angled. Leaves sessile, obscurely veined, obovate or broadly spatulate, thick, obtuse, ascending or erect by a twist at the base, ½′–1′ long, 4″–8″ wide, entire, mucronulate, densely appressed-puberulent on both sides, the upper mostly oblong, much smaller; heads 4″–5″ high, cymose-paniculate; involucre narrowly campanulate, its bracts oblong or the inner linear, pubescent, their tips somewhat spreading; rays short; pappus white.

In dry soil, Virginia to Florida and Louisiana, mainly near the coast. Called also Rattlesnake-master. July–Sept.

3. Sericocarpus asteròides (L.) B.S.P. Toothed White-topped Aster. (Fig. 3734.)

Conyza asteroides L. Sp. Pl. 861. 1753.
S. conyzoides Nees, Gen. & Sp. Ast. 150. 1832.
S. asteroides B.S.P. Prel. Cat. N. Y. 26. 1888.

Stem pubescent, or glabrate, slightly angled, 1°–2° high. Leaves thin, pubescent or glabrous, ciliate, pinnately veined and faintly 3-nerved, the basal and lower ones obovate or spatulate, dentate or rarely entire, 2′–4′ long, 1′–1½′ wide, narrowed into margined petioles; upper leaves oblong or oblong-lanceolate, entire or dentate, acute or obtuse, smaller; heads 5″–6″ high, densely clustered; involucre campanulate, its bracts oblong, ciliate or pubescent, the outer with green reflexed tips; pappus brown or white.

In dry woods, Maine to Florida, west to Ohio, Kentucky and Alabama. July–Sept.

31. ÁSTER L. Sp. Pl. 872. 1753.*

Perennial or rarely annual, mostly branching herbs, with alternate leaves, and corymbose or paniculate (rarely racemose or solitary) heads of both tubular and radiate flowers. Involucre hemispheric, campanulate or turbinate, its bracts various, imbricated in several series, the exterior ones usually smaller and shorter. Receptacle flat or convex, generally foveolate. Ray-flowers white, pink, purple, blue, or violet, pistillate. Disk-flowers tubular, perfect, their corollas 5-lobed, usually yellow and changing to red, brown, or purple. Anthers obtuse and entire at the base. Style-branches flattened, their appendages subulate, lanceolate or ovate, acute. Pappus-bristles slender, numerous, scabrous or denticulate, usually in 1 series, sometimes in 2 series. Achenes mostly flattened and nerved. [Greek, star.]

A genus of not less than 250 species, most abundant in North America, where, in addition to the following, about 70 others occur beyond our limits. Known as Asters or Starworts.

A. Basal and lower leaves, or some of them, cordate and slender-petioled. (See No. 50.)

1. *None of the stem-leaves cordate-clasping.*

* Rays white, violet, or rose.

‡ Rays white, or rarely rose, usually 2-toothed; plants not glandular.

† Involucre ovoid, campanulate or turbinate, its bracts mostly obtuse or rounded; basal leaves few and small, or commonly none (except in No. 5).

(**a**) Leaves membranous or thin, smooth, or nearly so.

Heads short-peduncled, 9″ broad or less, the disk turning crimson; leaves acute or short-acuminate. 1. *A. carmesinus.*

Heads long-peduncled, 9″ broad or more, the disk turning brown or reddish brown; leaves long-acuminate.

Heads 1′ broad or more; leaves of the branches large, long, lanceolate, acuminate. 2. *A. tenebrosus.*

Heads 9″–12″ broad; leaves of the branches small, obtuse, or acute. 3. *A. divaricatus.*

* Text prepared with the assistance of Prof. Edward S. Burgess.

(**b**) Leaves thick, firm, rough.

Heads 6″–8″ high; inflorescence forking. 4. *A. furcatus.*

Heads 4″–5″ high; inflorescence paniculate or glomerate.

Leaves acute,or short-acuminate, pilose beneath; inflorescence glomerate. 5. *A. glomeratus.*

Leaves long-acuminate, not pilose beneath; inflorescence open-paniculate. 6. *A. Claytoni.*

† † Involucre cylindric, its bracts tapering to an obtuse apex; basal leaves large, tufted.

Bracts of the involucre pale, scarious, usually without herbaceous tips. 7. *A. curvescens.*

Bracts of the involucre broader, with herbaceous tips. 8. *A. Schreberi.*

⁂ Rays violet, usually 3-toothed; plants glandular.

† Predominant glands large, capitate; leaves thick, coarse, heavy.

Sinus broad; glands chiefly confined to the inflorescence; plant usually harsh. 9. *A. macrophyllus.*

Sinus narrow; glands abundant on the leaves and stem; growing plant clammy. 10. *A. roscidus.*

† † Predominant glands minute, scarcely capitate; leaves usually thin.

(**a**) Inflorescence rather regular, flat, or convex-topped; plants usually less than 2½° tall.

Sinus broad, shallow.

Broader leaves orbicular-cordate, their teeth and the inflorescence-leaves inconspicuous. 11. *A. ianthinus.*

Broader leaves reniform, sharply incised; some inflorescence-leaves conspicuous. 12. *A. violaris.*

Sinus rather deep and narrow; broader leaves ovate-cordate, sharply serrate. 13. *A. multiformis.*

(**b**) Inflorescence very irregular, paniculate-corymbose; plants often 4°–5° high; broader leaves large, cordate, acute. 14. *A. nobilis.*

⁂ ⁂ Rays blue or purple; plants not glandular.

† Bracts of the involucre spreading or recurved; rays 30–45. 15. *A. anomalus.*

† † Bracts of the involucre appressed, or erect; rays 8–20.

(**a**) Leaves all entire, or nearly so, thick, or firm.

Leaves nearly or quite glabrous above. 16. *A. Shortii.*

Leaves rough-puberulent on both sides, the upper bract-like. 17. *A. azureus.*

(**b**) Leaves nearly all sharply serrate, thin.

Heads 2″–3″ high, numerous; bracts obtuse or obtusish.

Leaves rough; petioles not wing-margined; bracts appressed. 18. *A. cordifolius.*

Leaves smooth, or nearly so; petioles, or some of them, wing-margined. 19. *A. Lowrieanus.*

Heads 4″–5″ high, usually few; bracts acute or acuminate. 20. *A. Lindleyanus.*

Heads 3″–5″ high, numerous; bracts acute or acuminate.

Stem densely and finely pubescent. 21. *A. Drummondii.*

Stem glabrous or nearly so; bract-tips spreading. 22. *A. sagittifolius.*

2. *Stem leaves, or some of them, cordate-clasping; plant rough when dry.* 23. *A. undulatus.*

B. No cordate and petioled leaves; those of the stem, or some of them, with more or less cordate or auricled clasping bases.

1. *Stem rough, or hirsute-pubescent.*

⁂ Leaves entire, oblong, linear, or lanceolate.

⁘ Heads 1′–2′ broad; leaves sessile, strongly cordate-clasping.

† Stem rough; leaves oblong to lanceolate; involucre turbinate.

Leaves thick, firm, very rough, oblong to oval. 24. *A. patens.*

Leaves thin, roughish, oblong-lanceolate. 25. *A. phlogifolius.*

† † Stem hirsute; leaves lanceolate; involucre hemispheric. 26. *A. Novae-Angliae.*

⁘ ⁘ Heads ½′–1′ broad; leaves but slightly clasping.

Involucre hemispheric, its bracts glandular. 27. *A. oblongifolius.*

Involucre turbinate, its bracts hispid. 28. *A. amethystinus.*

⁂ ⁂ Leaves, at least the lower, serrate.

Stems usually pilose; bracts very glandular. 29. *A. major.*

Stem hispid-pubescent; bracts glabrous, or ciliate. 30. *A. puniceus.*

2. *Stem glabrous, or only sparingly pubescent above.*

⁂ Leaves sharply serrate.

⁘ Leaves tapering to the base.

Outer bracts of the involucre foliaceous. 31. *A. tardiflorus.*

Bracts of the involucre narrow, not foliaceous.

Leaves lanceolate, to oblong-lanceolate, sessile. 30. *A. puniceus.*

Leaves oval to ovate, the lower often petioled. 32. *A. patulus.*

⁘ ⁘ Leaves abruptly contracted into margined petioles, often enlarged near the base. 33. *A. prenanthoides.*

⁘ ⁘ ⁘ Leaves strongly cordate-clasping; bracts green-tipped. 34. *A. laevis.*

⁂ ⁂ Leaves entire, or very nearly so.

⁘ Involucre campanulate, its bracts appressed, green-tipped.

† Bracts of the involucre with rhomboid green tips.

Stem leaves oblong, lanceolate, or oval-lanceolate. 34. *A. laevis.*

Stem leaves elongated-lanceolate. 35. *A. concinnus.*

† † Bracts of the involucre linear, the tips narrower, lanceolate; stem leaves linear or narrowly lanceolate. 36. *A. purpuratus.*

⁘ ⁘ Involucre hemispheric.

† Bracts of the involucre narrow, not foliaceous.

(**a**) Bracts in several series unequal.

Bracts linear-subulate; leaves narrowly linear. 37. *A. junceus.*

Bracts lanceolate, linear, or spatulate; leaves lanceolate to linear.

Western dry soil plant, 1°–2° tall; leaves 1′–3′ long. 38. *A. adscendens.*

Eastern swamp plant, 2°–5° tall; leaves 2′–6′ long. 39. *A. Novi-Belgii.*

(**b**) Bracts in only 1 or 2 series; leaves linear to lanceolate. 40. *A. longifolius.*

† † Bracts of the involucre green, foliaceous; western. 41. *A. foliaceus.*

C. Leaves sessile, or petioled, not at all clasping, or scarcely so.

1. *Leaves silky, silvery or canescent on both sides, entire.*

Heads corymbose-paniculate; bracts oblong; achenes glabrous. 42. *A. sericeus.*

Heads in a narrow raceme; bracts linear; achenes silky. 43. *A. concolor.*

2. *Leaves neither silky, silvery nor canescent, often toothed.*
☆ Rays normally purple, blue, pink, or violet; not white.
⁒ Leaves bristly ciliate, linear, rigid; western species. 44. *A. Fendleri.*
⁒ ⁒ Leaves not bristly-ciliate.
† Tips of the involucral bracts strongly squarrose.
Leaves linear to linear-oblong, rigid, obtuse, entire; heads 2′ broad. 45. *A. grandiflorus.*
Leaves lanceolate to oblong, at least the lower dentate.
Involucre hemispheric, or nearly so; heads 1′ broad or more.
Bracts of the involucre glandular. 46. *A. spectabilis.*
Bracts of the involucre ciliate, or glabrous. 47. *A. surculosus.*
Involucre turbinate; heads 6″–9″ broad. 48. *A. gracilis.*
† † Tips of the involucral bracts appressed, or erect (except in forms of No. 50).
( ) Bracts of the involucre coriaceous or herbaceous, oblong, lanceolate, or spatulate.
Bracts of the involucre coriaceous, obtuse.
Involucre hemispheric; leaves oblong, sharply serrate; stem smooth. 49. *A. Radula.*
Involucre turbinate.
Leaves ovate-oblong, the lower dentate; stem rough. 50. *A. Herveyi.*
Leaves linear-oblong, entire, ciliolate. 51. *A. turbinellus.*
Bracts of the involucre herbaceous, foliaceous, acute; leaves oblong, very rough. 52. *A. Nebraskensis.*
Bracts of the involucre rigid, lanceolate, large, acute; leaves linear. 53. *A. paludosus.*
(**b**) Bracts of the involucre linear-subulate, membranous, acute. 54. *A. nemoralis.*
☆ ☆ Rays mostly white or nearly so (often pink or purple in Nos. 55, 57, 58 and 59).
⁒ Heads corymbose, 10″–20″ broad.
Leaves ovate-oblong, acuminate, sharply serrate; bracts linear-subulate. 55. *A. acuminatus.*
Leaves linear, entire, or nearly so; bracts oblong, obtuse. 56. *A. ptarmicoides.*
⁒ ⁒ Heads solitary at the ends of slender branchlets. 57. *A. dumosus.*
⁒ ⁒ ⁒ Heads paniculate, or racemose, 4″–10″ broad.
† Bracts of the involucre acute to obtusish; plants glabrous or pubescent.
(**a**) Heads paniculate, not in 1-sided racemes.
Stem-leaves lanceolate, serrate or entire.
Heads 8″–10″ broad.
Plants glabrous, or sparingly pubescent above.
Leaves firm, roughish or rough; rays often bluish. 58. *A. salicifolius.*
Leaves thin, smoothish; rays chiefly white. 59. *A. paniculatus.*
Plant puberulent all over. 60. *A. Missouriensis.*
Heads 6″–8″ broad; stem-leaves narrowly lanceolate. 61. *A. Tradescanti.*
Stem-leaves linear-lanceolate to subulate, mostly entire.
Heads scattered, 6″–9″ broad; upper leaves linear. 62. *A. Faxoni.*
Heads numerous, 4″–7″ broad; upper leaves subulate.
Paniculately branched, bushy. 63. *A. ericoides.*
Simple, or with ascending slender branches; northern. 64. *A. Pringlei.*
(**b**) Heads racemose and 1-sided on the branches.
Stem-leaves oval, oblong, or lanceolate, serrate, or chiefly so.
Stem pubescent or glabrate. 65. *A. lateriflorus.*
Stem villous; leaves narrowly lanceolate, thin. 66. *A. hirsuticaulis.*
Stem-leaves linear-lanceolate to linear, nearly entire; stem glabrate. 67. *A. vimineus.*
† † Bracts of the involucre, at least the outer, obtuse; plants very rough.
Heads 3″–4″ broad, very numerous, densely clustered. 68. *A. multiflorus.*
Heads 6″–8″ broad, rather loosely clustered; western. 69. *A. incanopilosus.*
D. Leaves fleshy, narrow, entire; plants of salt marshes or saline soil (No. 71 sometimes in non-saline situations).
Perennial; heads 6″–12″ broad; involucral bracts lanceolate, acuminate. 70. *A. tenuifolius.*
Annuals; heads 3″–5″ broad; involucral bracts linear-subulate.
Involucre campanulate; disk-flowers more numerous than the rays; rays about 2″ long. 71. *A. exilis.*
Involucre cylindraceous; disk-flowers fewer than the very short rays. 72. *A. subulatus.*

1. Aster carmesinus Burgess. Crimson-disk Aster. (Fig. 3735.)

Stems erect, delicate, closely tufted, 1°–2° high, glabrous, reddish brown, terete. Leaves all petioled, glabrate, very thin, but firm and crisp, the lower and basal ones oval, rounded, or with a small deep and rounded sinus at the base, bluntly acute or short-acuminate at the apex, crenate-serrate, the upper ones sometimes ovate-lanceolate, the uppermost short-elliptic; petioles slender, the uppermost sometimes winged; inflorescence 5′ broad, or less, usually of about 5 convex glomerules, each often of 10–15 short-peduncled heads, its branches spreading, 3′ long, or less; rays chiefly 6, white; disk at first golden yellow, finally deep purplish crimson; florets broadly bell-shaped; outer bracts obtuse, ciliate, pale, with a green tip; achenes glabrous.

On shaded rocks, near Yonkers, N. Y. Peculiar in its dense glomerules subtended by large short-elliptic leaves. September.

2. Aster tenebròsus Burgess. Long-leaved Wood Aster. (Fig. 3736.)

Stems solitary or scattered, glabrate, striate, about 3° high. Leaves very thin and smooth, slender-petioled, broadly oblong, coarsely toothed with remote acuminate teeth, abruptly long-acuminate at the apex, the basal sinus broad, rounded, shallow, except in the lowest ones; leaves of the inflorescence lanceolate, subentire, sessile, sometimes 4′ long; inflorescence broadly corymbose, heads about 4″ high, often 1¼′ broad; rays usually 9–12; disk pale yellow, becoming purplish brown, the florets funnelform with a long slender tube; outer bracts chiefly elongated-triangular, acute, green, the others linear, obtusish, the green tip lanceliuear; achenes generally glabrous.

In moist dark woodlands, New York to Virginia. Peculiar in its large dark leaves with coarser teeth than in the next species. Aug.–Sept.

3. Aster divaricàtus L. White Wood Aster. (Fig. 3737.)

Aster divaricatus L. Sp. Pl. 873. 1753.
Aster corymbosus Ait. Hort. Kew. 3: 207. 1789.

Stems tufted, assurgent, flexuous, brittle, terete, 1½°–2° high, glabrate at maturity. Leaves thin, smoothish, slender-petioled, ovate-lanceolate, closely dentate with sharp teeth, or the small basal ones coarsely serrate, acute to acuminate, the basal sinus moderate; leaves of the inflorescence small, short, ovate and acute to orbicular, subentire; corymb broad, flattish, repeatedly forked, the slender branches long, divergent; heads 9″–12″ broad; rays chiefly 6–9, linear, white; disk turning brown; bracts of the involucre broad, ciliate, the rounded tip with an inconspicuous green spot.

In open woodlands and thickets, in rather dry soil, Canada to Manitoba, Georgia and Tennessee. Variable; rays rarely rose-purple. Sept.–Oct.

Aster divaricàtus cymulòsus Burgess.

Smaller, bearing a single dense corymb about 4′ broad, or several smaller ones; the branches short, suberect; acumination of the leaves, sinus, and teeth conspicuous; upper leaves much reduced; rays short, broad, chiefly 3″–4″ long, sometimes laciniate. In grassy openings in woods, often in dense patches, New England and New York to Virginia.

Aster divaricàtus curtifòlius Burgess.

Stem erect, reddish, smooth, sometimes glaucous; leaves small, dull green, firm, ovate and orbicular to reniform, the sinus broad, rounded, the apex obtuse or apiculate; inflorescence loose, flattish; disks turning purple; rays about 5″ long; green tips of the involucral bracts conspicuous. In moist woods, New York to Virginia.

Aster divaricàtus deltòideus Burgess.

Delicate, 1½° high or less; lower leaves triangular, cordate with a broad sinus or subtruncate, the apex incurved-acuminate; the teeth large, sharp; petioles often all filiform; veins directed forward; heads nearly as in the preceding variety. In moist shaded places, New England to New York, Virginia and Tennessee.

Aster divaricàtus persàliens Burgess.

Stems virgate, 2½° high, or less; leaves extremely thin, firm, chiefly lanceolate-acuminate, long and narrow, the teeth very slender, salient or recurved, the lowest ovate with a small narrow sinus; disk maroon. In deep shade, New England and New York to Virginia and Kentucky.

Aster divaricàtus fontinàlis Burgess,

Plants solitary; basal leaves often numerous, tufted, thin, smoothish, sharply serrate or dentate, 6′ long by 4½′ broad, or smaller, broadly oval, acute, the base subcordate or rounded; inflorescence usually ample, the long virgate branches with numerous small oval-oblong leaves; involucre turbinate, its bracts with definite green tips. In springy places and grassy ditches in open sunny situations, New England and New York to Virginia.

Aster viridis Nees, remarkable for its coarse rough basal leaves, and large oval rhomboid rameal ones, occasional from New York and Pennsylvania to Virginia, may prove to be a hybrid between the preceding and *A. macrophyllus* L.

4. **Aster furcàtus** Burgess. Forking Aster. (Fig. 3738.)

Stem leafy, 1½° high, or less, loosely forked above. Leaves hispid above, hispidulous beneath, firm, saliently cut-toothed, the lower ovate, short-petioled, with a small or shallow sinus, the upper sessile, with broad laciniate winged bases, often 5′ long by 2½′ wide, the uppermost elliptic-oblong, often 3½′ long; teeth long and low, sharp; heads few (5–20), slender-peduncled; involucre turbinate to campanulate, with a truncate or rounded base; rays 3-toothed; disk turning brown, the florets funnelform with rather broad lobes; pappus long, straight; achenes pubescent, subangular, not constricted at the summit.

In woods, especially on shaded cliffs, Illinois and Missouri. Aug.–Oct.

5. **Aster glomeràtus** (Nees) Bernh. Bernhardi's Aster. (Fig. 3739.)

Aster glomeratus Bernh. in Nees, Ast. 139. 1832.
Eurybia glomerata Nees, Gen. & Sp. Ast. 139. 1832.

Loosely clustered, dull green. Leaves not large, mostly short-pilose beneath, thickish, rough above; basal leaves present, these and the lower stem-leaves cordate with a deep narrow sinus, the teeth sharp, rather close and small; petioles slender, ciliate; upper leaves much smaller, ovate, truncate with a short broadly winged base, or the uppermost ovate to lanceolate, sessile, entire; inflorescence compact, of many glomerate clusters, round-topped; heads about 4″ high; bracts pubescent, obtuse, green, the inner twice as long as the outer; rays about 6, cream-white, short, soon deciduous; disk turning brown.

In moist thickets or swamps, especially in ravines, New York and Pennsylvania. July.

6. **Aster Clàytoni** Burgess. Clayton's Aster. (Fig. 3740.)

Similar to *A. divaricatus*, stems red, tough. Leaves chiefly ovate-lanceolate, not large, rough, thick, slender-petioled, coarsely serrate, pale, or dull, the apex incurved-acuminate, the upper spreading or deflexed, sessile by a broad base, lanceolate-triangular, serrulate; inflorescence high, with percurrent axis, the long suberect branches each bearing a small umbelliform cluster of heads; peduncles filiform, as long as the heads, 3″–4″ long; bracts pale; rays short, narrow, chiefly 6, snow-white; disks at first golden-yellow, finally sienna-brown; florets about 20, achenes densely short-hairy.

In sunny or slightly shaded rocky places, New York to the mountains of Virginia. Sept.

Aster Clàytoni crispicans Burgess.

Basal leaves often not cordate, deeply incised; those of the stem long-acuminate or even caudate sharply serrate with large acute close teeth, some of which are suberect; chief bracts of the involucre acute. On rocky banks, solitary or in small clusters, Maine to New York and New Jersey.

7. Aster curvéscens Burgess. Dome-topped Aster. (Fig. 3741.)

Dark green, chiefly glabrous; rootstocks often 10′ long; stem pale green, striate, delicate, 1½°–2° high. Basal leaves tufted, conspicuous, these and the lowest stem leaves with a broad shallow sinus tapering into a petiole 1–2 times as long as the blade, abruptly incurved-acuminate; middle leaves ovate, short-petioled, rounded at the base, the upper lanceolate, slenderly acuminate, often falcate; leaves firm, smoothish, the teeth broad, curved; inflorescence small, convex, 3′–5′ broad, its short filiform naked branches widely ascending; heads 4″–5″ high; lower bracts short, obtuse, the others longer, nearly uniform, scarious, shining, linear, often acute, usually glabrous; rays about 8, cream-white, about 5″ long; disk becoming purple brown; pappus early reddening; achenes slender, glabrous.

In loose moist shaded soil, New England and New York to Virginia. Aug.–Sept.

Aster curvéscens umbellifórmis Burgess.

Stem very smooth, deep red, robust, straight, sometimes 3½° tall; leaves apple-green, smooth when dry, sparingly toothed; inflorescence symmetrically umbelliform, decompound; sinus of the lower leaves rather deep and narrow. In grassy woods and thickets, Connecticut and to Virginia.

Aster curvéscens ovifórmis Burgess.

Stem about 2½° high, leafy; leaves dull green, not acuminate, very thin but rough, ovate, cordate with a deep narrow sinus, 8′ long by 4¼′ wide, or smaller; some of the bracts broader and green-tipped; inflorescence smaller and less branched. Range of the preceding.

8. Aster Schréberi Nees. Schreber's Aster. (Fig. 3742.)

Aster Schreberi Nees, Syn. Ast. 16. 1818.

Stem stout, 2°–3° high, with long internodes. Basal leaves often in extensive colonies, thin, dull green, firm, rough above, with scattered slender appressed bristles, pubescent beneath on the veins, reniform-cordate or cordate-triangular, often 7′ long by 5′ wide, the basal sinus when well developed rectangular, 2′ across and 1′ deep; upper leaves ovate-oblong to lanceolate, with a short broad basal wing, or sessile; petioles of the lower leaves long, conspicuously ciliate when young; inflorescence decompound, flattish, or irregularly convex, 6′–12′ broad; heads about 5″ high; bracts greenish, mostly obtuse, ribs and midrib dark green, ciliate; rays usually 10.

In borders of woods, and along fence rows in partial shade, New York to Michigan and Virginia. July–Aug.

9. Aster macrophýllus L. Large-leaved Aster. (Fig. 3743.)

Aster macrophyllus L. Sp. Pl. Ed. 2, 1232. 1763.

Rough; rootstocks long, thick; stem reddish, angular, 2°–3° high. Basal leaves forming large colonies, 3 or 4 to each stem, broad, cordate with a large irregular sinus, rough above, harsh, thick, the teeth broad, curved, pointed, the petioles long, narrow; upper stem leaves oblong with short broadly winged petioles, the uppermost sessile, acute; inflorescence strigose and glandular, broadly corymbose, irregular; heads 5″–6″ high; peduncles rigid, thickish; rays about 16, 5″–7″ long, chiefly lavender, sometimes violet, rarely pale; bracts conspicuously green-tipped, the lower acute, the inner oblong, obtuse; disk turning reddish brown; florets short-lobed.

In moderately dry soil, in shaded places, Canada to Minnesota and North Carolina. Aug.

Aster macrophýllus velùtinus Burgess.

Smaller; leaves small, ovate-triangular, slender petioled, often truncate at the base, about 2½′ long by 2′ wide, sometimes none of them cordate; glands fewer; pubescence subpilose or velvety; bracts broad, flat, green; rays violet or blue. In grassy woods and thickets, especially in mountainous regions, Maine to Minnesota and West Virginia. Ascends to 2400 ft. in the Adirondacks.

Aster macrophýllus sejúnctus Burgess.

Strigose-pubescent; glands numerous; leaves apple-green above, pale beneath, chiefly cordate-orbicular, abruptly short-acuminate, thick, spongy, commonly minutely wrinkled; basal leaves few; bracts narrow, obtuse; peduncles slender; inflorescence dense, convex, 4′–8′ broad, not leafy; rays lilac. In open grassy places, Maine to Pennsylvania and Wisconsin.

Aster macrophýllus apricénsis Burgess.

Glabrate, branched from near the base, the branches numerous, often 18′ high; heads small, numerous; rays short, pinkish lavender; leaves broad, oval to ovate, the teeth and sinus little developed; petioles often expanded into a long wing, sometimes 3′ long and ½′ wide; uppermost leaves short-oblong with a narrowed sessile base. In clearings and open gravelly or sandy places, New York and Pennsylvania.

Aster macrophýllus bifórmis Burgess.

Small, stocky, with 3 or 4 small oval closely crenate spongy-thickened lower leaves with long slender petioles, the sinus deep, narrow, the teeth triangular to semicircular; stem-leaves crowded, much reduced, subentire, ovate-oblong, subsessile; inflorescence nearly naked, dense, convex, usually 4′ broad; strigose pubescence little developed; rays lilac. In open grassy sunny situations, forming small patches, Maine to Ontario and Lake Erie.

Aster macrophýllus pinguifólius Burgess.

Stems stout, leafy, glabrous, about 2° high; basal and lower leaves large, forming extensive patches, deep green above, very pale beneath, many of them appearing greasy, some roughening in drying; petioles fleshy, sometimes 9′ long; inflorescence broad, flat-topped; heads large; rays lavender to almost white; only the upper leaves sessile. Borders of woods, Connecticut and Long Island to Minnesota.

Aster macrophýllus excélsior Burgess.

Stem robust, glabrous, often 4° tall, purple, or glaucous; leaves mostly very smooth, pale, numerous, narrower, cordate-oblong to ovate-lanceolate, chiefly sessile; rays deep lilac to violet. Along paths and borders of rocky woods, Ontario and western New York to Michigan.

10. Aster róscidus Burgess. Dewy-leaf Aster. (Fig. 3744.)

Clammy-hairy, odorous, copiously glandular when young, somewhat so at maturity; stem 3° high, or less. Basal leaves in close colonies, coriaceous, the earlier ones cordate-quadrate, low-serrate, the sinus deep, narrow, the later, or winter leaves elliptic, long-petioled, often prostrate, often 5′ long; stem leaves chiefly orbicular and not cordate, with short broadly winged petioles, rarely slender-petioled; inflorescence convex, sometimes irregular; involucre hemispheric, its bracts chiefly with rounded ciliate tips, rays 14–16, broad, clear violet; disks at first golden yellow, soon turning red; pappus long, white, copious.

In slight shade and rich cleared woodlands, Maine to Pennsylvania and Michigan. Aug.–Sept.

11. Aster iánthinus Burgess. Violet Wood Aster. (Fig. 3745.)

Glandular, dark green, slightly strigose-pubescent. Stem erect, or decumbent, 2°–3° tall; leaves thinnish, rough, the lower and basal ones orbicular to oblong, 5′ long, or less, abruptly acuminate, low-serrate or crenate; the sinus broad, open, shallow, upper leaves sessile by a narrowed base, crenate-serrate; inflorescence open, nearly naked, peduncles slender, divergent; heads large; rays 10–13, long, very deep violet or sometimes pale, 4″–6″ long; bracts green-tipped, little pubescent.

On shaded banks and along woodland paths, Maine to Lake Erie and West Virginia. July–Oct.

12. Aster violàris Burgess. Violet-leaf Aster. (Fig. 3746.)

Caudex thick, fleshy; plant glabrate, bluish green, minutely glandular. Stem slender, erect, or assurgent, 2° high, or less; basal and lower leaves broadly reniform, abruptly acuminate or apiculate, often 3′ long by 4′ wide, their slender petioles 6′–8′ long, the sinus very broad and shallow; middle stem leaves similar, not cordate; the upper numerous, long-elliptic, chiefly with narrowed bases, all thin, firm, rough above; inflorescence leafy, small, loose, rather narrow and high, paniculate-corymbose, nearly level-topped, its slender branches with nearly opposite, oblong leaves; heads 6″ high, or more; rays 12–15, pale violet, narrow.

In shaded moist places, sometimes in leaf-mold among rocks, New York from the Hudson to Lake Erie. Sept.–Oct.

13. Aster multifórmis Burgess. Various-leaved Aster. (Fig. 3747.)

Deep green, minutely glandular. Stem erect, slender, 1°–2° high, angular-striate in drying. Basal leaves usually 2, large, thick, cordate-oblong, often accompanied by later smaller oblong ones; stem leaves very thin, sharply serrate, rough above, minutely puberulent beneath, the lower, ovate, acuminate, usually with a narrow sinus, the upper oval to ovate-lanceolate, petioled, the uppermost elliptic-lanceolate, serrulate, sessile or nearly so; inflorescence small, its branches upwardly curved; heads about 7″ high, rays about 13, rounded and retuse at the apex; bracts green, glands few, almost hidden by the minutely strigose pubescence of the peduncles.

In moist shaded places, Maine to western New York, Pennsylvania and Maryland. July–Aug.

14. Aster nóbilis Burgess. Stately Aster. (Fig. 3748.)

Tall, minutely glandular above, stem shining, bright green, 4°–5° high. Leaves thin, but firm, smooth in growth, roughened in drying, minutely puberulent beneath, dark green, basal and lower leaves large, the blade often 9′ long by 6′ wide, about as long as the stout petiole, sharply toothed, the sinus deep, broad, or the lobes overlapping; stem leaves similar, the upper oblong-lanceolate, sessile; inflorescence irregularly cymose-paniculate, with small subulate recurved leaves; bracts long, acute, green; heads 6″ high, or less; rays 13–15, violet-blue or pale violet; disk-flowers not numerous, their corollas funnelform with a long capillary tube.

In leaf-mold, Lake Champlain to Lake Erie. Aug.

15. Aster anómalus Engelm. Many-rayed Aster. (Fig. 3749.)

Aster anomalus Engelm.; T. & G. Fl. N. A. 2: 503. 1843.

Stem rough, rather stout, branched above, 1°–3° high. Leaves thin, the lower and basal ones deeply cordate, ovate, or ovate-lanceolate, entire or slightly repand, rough-pubescent on both surfaces, acute or acuminate at the apex, 3′–4′ long, 1′–2′ wide, on slender naked petioles; upper leaves short-petioled or sessile, lanceolate, oblong, or linear, much smaller; heads few, 4″–6″ high, 12″–15″ broad; receptacle hemispheric, its bracts lanceolate, acute, or acuminate, hirsute, imbricated in several series, their foliaceous tips spreading or reflexed; rays 30–45, 5″–6″ long, bright violet-blue; pappus whitish.

On limestone cliffs, Illinois to Missouri and Arkansas. Sept.

16. Aster Shórtii Hook. Short's Aster. (Fig. 3750.)

Aster Shortii Hook. Fl. Bor. Am. 2: 9. 1834.

Stem roughish or smooth, slender, paniculately branched above, 2°–4° high. Leaves thick, glabrous or nearly so above, finely and sparingly pubescent beneath, the lower and basal ones ovate or ovate-lanceolate, cordate at the base, acute or acuminate at the apex, slightly deutate, or entire, 2′–6′ long, 1′–2′ wide, borne on slender naked petioles; upper leaves lanceolate, entire, sessile or short-petioled, not cordate, those of the branches small and bract-like; heads numerous, 5″–7″ high; involucre broadly campanulate, its bracts linear, acute, puberulent, imbricated in several series, their green tips appressed; rays 10–15, linear, violet-blue, 5″–6″ long; pappus tawny.

On banks and along edges of woods, western Pennsylvania to Virginia and Georgia, west to Illinois and Tennessee. Sept.-Oct.

17. Aster azùreus Lindl. Sky-blue Aster. (Fig. 3751.)

Aster azureus Lindl.; Hook. Comp. Bot. Mag. 1: 98. 1835.

Stem slender, stiff, rough, branched above, 1°–4° high. Leaves thick, usually all entire, scabrous on both sides, the lower and basal ones cordate, ovate, ovate-lanceolate, or lanceolate, acute, acuminate, or obtusish, 2′–6′ long, with slender naked often pubescent petioles; upper leaves short-petioled or sessile, lanceolate or linear, those of the branches reduced to small appressed bracts; heads numerous, 4″–5″ high; involucre turbinate, its bracts glabrous, linear-oblong, abruptly acute, imbricated in several series, their green tips appressed; rays 10–20, bright blue, 3″–4″ long; pappus tawny.

On prairies and along borders of woods, western New York to Georgia, west to Minnesota, Missouri and Texas. Aug.-Oct.

18. Aster cordifòlius L. Common Blue Wood Aster. (Fig. 3752.)

Aster cordifolius L. Sp. Pl. 875. 1753.

Stem glabrous or nearly so, much branched, bushy, 1°–5° high. Leaves thin, rough, more or less pubescent with scattered hairs above and on the veins beneath, sharply serrate, acuminate, the lower and basal ones slender-petioled, broadly ovate-cordate, 2′–5′ long, the upper short-petioled or sessile, ovate or lanceolate, smaller; petioles scarcely margined; heads very numerous, small, 2″–3″ high, 6″–9″ broad, handsome; involucre turbinate to cylindric, its bracts oblong-linear, obtuse or obtusish, green-tipped, appressed; rays 10–20, 3″–4″ long, violet or blue, sometimes pale (rarely white); pappus whitish.

Woods and thickets, New Brunswick to Minnesota, Georgia and Missouri. Sept.–Dec.

Aster cordifòlius Furbíshiae Fernald, Proc. Portland Soc. Nat. Hist. 2: 129. 1897.
Similar; stem and petioles densely villous, the leaves somewhat so beneath. Northern Maine.

Aster cordifòlius polycéphalus Porter, Bull. Torr. Club, 21: 120. 1804.
More robust and more branched than the type; leaves smaller, often rough only when dry, the upper ones sessile, ovate; panicle large; heads usually smaller, very numerous; rays deep blue, or paler. Massachusetts and eastern Pennsylvania to Virginia.

Aster cordifòlius alveàrius Burgess.
Leaves thin, usually smoothish, cordate, triangular-lanceolate, or broader; inflorescence dense, thyrsoid, not leafy, in form resembling that of the lilac; bracts linear, acute; heads medium sized; rays blue. On shaded banks, Massachusetts to North Carolina and Tennessee.

Aster cordifòlius pedicellàtus Burgess.
Stem leafy, often 4° high; leaves thin, the lower ovate, cordate, the upper ovate-lanceolate, or those of the branches elliptic and subentire; inflorescence loosely pyramidal, often 2° high and 1½° broad, its ultimate branchlets long and often naked; heads large, 9″ broad, or more, often 5″ high; rays chiefly purple-blue; bracts obtuse. In moist wood borders, Ontario to Virginia and Kentucky.

19. Aster Lowrieànus Porter. Lowrie's Aster. (Fig. 3753.)

Aster cordifolius var. *laevigatus* Porter, Bull. Torr. Club, 16: 67. 1889. Not *A. laevigatus* Lam. 1783.

Aster Lowrieanus Porter, Bull. Torr. Club, 21: 121. 1894.

Glabrous, or very nearly so throughout; stem branched, 1°–4° high. Leaves thickish, firm, a little succulent, the basal slender-petioled, ovate to ovate-lanceolate, cordate, acute or obtusish, serrate, 2′–6′ long, those of the stem ovate to oblong, often cordate, contracted into winged petioles, the uppermost lanceolate; heads usually not very numerous, 2½″–3″ high, loosely panicled; involucre turbinate, its bracts obtuse or obtusish, appressed; rays light blue, 3″–4″ long, but variable in length.

In woods, Connecticut and southern New York to Pennsylvania, Ohio, Virginia and Kentucky. Sept.–Oct.

Aster Lowrieànus lancifòlius Porter, Mem. Torr. Club, 5: 325. 1894.
A. cordifolius var. *lanceolatus* Porter, Bull. Torr. Club, 16: 68. 1889. Not *A. lanceolatus* Willd. 1804.
Leaves lanceolate, appressed-serrate, only the basal ones cordate. Southern New York and Pennsylvania.

Aster Lowrieànus Bicknéllii Porter, Mem. Torr. Club, 5: 325. 1894.
Aster cordifolius var. *incisus* Britton, Bull. Torr. Club, 19: 224. 1892. Not *A. incisus* Fisch. 1812.
Leaves all lanceolate, all sharply serrate, or the lowest incised, usually none of them cordate. Southern New York and Pennsylvania.

20. Aster Lindleyànus T. & G. Lindley's Aster. (Fig. 3754.)

Aster Lindleyanus T. & G. Fl. N. A. 2: 122. 1841.

Stem usually stout, glabrous, or sparingly pubescent, 1°–3½° high, branched above. Leaves rather thick, glabrous, or slightly pubescent, especially on the veins, the lower and basal ones cordate at the base, sharply serrate, ovate, acute or acuminate, 2′–4′ long, with slender naked petioles; upper leaves ovate, ovate-lanceolate, or lanceolate, less serrate, or entire, sessile, or with margined petioles, those of the branches lanceolate or linear-lanceolate, smaller; heads usually not numerous, 4″–5″ high; involucre broadly turbinate or nearly hemispheric, its bracts linear-lanceolate, acute, rather loosely imbricated, glabrous, or nearly so, their tips green; rays 10–20, blue or violet, 3″–5″ long; pappus nearly white.

In open places, Labrador to the Northwest Territory and British Columbia, south to Maine and Michigan. Aug.–Oct.

Aster Lindleyànus eximius Burgess.

Tall, sometimes 7° high; leaves thick, usually rough and strigose-pubescent above, almost glabrous beneath; inflorescence widely branched, loosely paniculate, often over 2° long; rays bluish purple; heads nearly 1′ broad; bracts linear, abruptly acute. New Hampshire to Ohio and Virginia.

21. Aster Drummóndii Lindl. Drummond's Aster. (Fig. 3755.)

Aster Drummondii Lindl. in Hook. Comp. Bot. Mag. 1: 97. 1835.

Stem usually stout, finely and densely canescent, branched above, 2°–5° high. Leaves mostly thin, ovate or ovate-lanceolate, acuminate, rough above, canescent beneath, the lower and basal ones cordate, with slender naked petioles, sharply toothed, 2′–4′ long, the upper cordate or rounded at the base, usually on margined petioles, those of the branches sessile and entire or nearly so, much smaller; heads 3″–4″ high, rather numerous on the racemose branches; involucre turbinate, its bracts linear, slightly pubescent, acute or acuminate, their green tips appressed; rays 8–15, blue, 3″–4″ long; pappus whitish.

In dry soil, borders of woods and on prairies, Ohio to Minnesota, Arkansas and Texas. Sept.–Oct.

22. Aster sagittifòlius Willd. Arrow-leaved Aster. (Fig. 3756.)

Aster sagittifolius Willd. Sp. Pl. 3: 2035. 1804.

Stem stout, or slender, strict, glabrous, or sparingly pubescent above, 2°–5° high, paniculately branched at the inflorescence, the branches ascending. Leaves thin, slightly roughened, or glabrous above, usually glabrate beneath, the lower and basal ones cordate or sagittate, ovate-lanceolate, sharply serrate, acuminate, 3′–6′ long, with slender naked or narrowly margined petioles; upper leaves lanceolate, sessile, or on short and usually margined petioles, serrate or entire, those of the branches very small; heads 2½″–4″ high, 8″–10″ broad, numerous, crowded, racemose; involucre turbinate, its bracts linear-subulate, glabrous or nearly so, their tips green and slightly spreading; rays 10–15, light blue or purplish, 3″–4″ long; pappus whitish.

In dry soil, New Brunswick to North Dakota, New Jersey, Kentucky and Missouri. Aug.–Oct.

Aster sagittifòlius dissitiflòrus Burgess.

Differs from the typical form of the species in its broader looser pyramidal inflorescence, the somewhat larger and longer peduncled heads, the leaves less serrate, often none cordate. New York to Florida, Mississippi and Oklahoma.

Aster sagittifòlius urophýllus (Lindl.) Burgess.

Aster urophyllus Lindl.; DC. Prodr. 5: 233. 1836.

Leaves pilose beneath during growth, persistently so on the veins, rough above, lanceolate, acuminate, the lower, or all of them, cordate; stem often 5° tall, the narrow inflorescence sometimes 3° long; heads about 3″ high; rays white. Grassy thickets and river-banks, New York to Minuesota.

23. Aster undulàtus L. Wavy-leaf Aster. (Fig. 3757.)

Aster undulatus L. Sp. Pl. 875. 1753.

Stem stiff, very rough and pubescent, divaricately branched above, 1°–3½° high. Leaves usually thick, rough on both sides, pubescent beneath, dentate, undulate or entire, acute or acuminate, the lowest and basal ones ovate, cordate, 2′–5′ long, with naked or margined petioles; middle ones ovate, lanceolate or oblong, with margined petioles dilated and clasping at the base, the upper sessile or clasping, those of the branches small and subulate; heads numerous, racemose and often secund on the spreading branches, about 4″ high, 8″–10″ broad; involucre broadly turbinate, its bracts linear-oblong, pubescent, acute or acutish, their green tips appressed; rays 8–15, pale blue to violet, 3″–5″ long; pappus whitish.

In dry soil, New Brunswick and Ontario, south to Florida, Alabama and Arkansas. Called also Small Fleabane and Various-leaved Aster. Sept.–Oct.

Aster undulàtus abruptifòlius Burgess.

Tall 3°–5° high; leaves rougher, chiefly short-ovate, sessile, entire and about 2′ long, 1½′ broad; inflorescence pyramidal; heads much darker, more crowded. New England to Virginia.

Aster undulàtus lorifórmis Burgess.

Predominant leaves greatly elongated, linear-oblong to linear-lanceolate, often 6′ long, with the clasping base narrowed or broadened, only a few of the lower ones contracted into winged petioles; plant little pubescent at maturity. Eastern Massachusetts to Virginia and Pennsylvania.

Aster undulàtus torquàtus Burgess.

Leafy, 8′–14′ high, dark green, short-downy; leaves small, very short and broad, close together, entire, their bases clasping the stem as a succession of collars often ½′ in diameter; lowest leaves petioled; inflorescence much branched, paniculate. Martha's Vineyard, Mass., to Long Island.

Aster undulàtus triangulàris Burgess.

Tall, leafy, 3°–7° high, pale; pubescence slight; leaves hispid above, ovate-triangular, acuminate, chiefly 2′–3′ long, ¾′ broad and sessile. New York to South Carolina.

24. Aster pàtens Ait. Late Purple Aster. (Fig. 3758.)

Aster patens Ait. Hort. Kew. 3: 201. 1789.

Stem slender, rough, 1°–3° high, divergently branched. Leaves ovate-oblong to oblong-lanceolate, rough or pubescent, thick and somewhat rigid, strongly cordate or auriculate-clasping at the broad base, entire, acute, or the lowest obtuse, 1′–3′ long, those of the branches much smaller and bractlike, the margins rough-ciliate; heads 1′ broad or more, solitary at the ends of the branches; involucre broadly turbinate, its bracts linear-oblong, finely pubescent or scabrous and somewhat glandular, imbricated in several series, their green acute tips spreading; rays 20–30, purplish-blue, or deep violet, 4″–6″ long; pappus tawny; achenes pubescent.

In dry, open places, Massachusetts to northern New York and Minnesota, south to Florida, Louisiana and Texas. Reported from Canada. Known also as Purple Daisy. Aug.–Oct.

25. Aster phlogifòlius Muhl. Thin-leaved Purple Aster. (Fig. 3759.)

A. phlogifolius Muhl.; Willd. Sp. Pl. 3: 2034. 1804.
Aster patens var. *phlogifolius* Nees, Gen. & Sp. Ast. 49. 1832.

Similar to the preceding species, usually taller. Leaves larger, lanceolate to oblong-lanceolate, entire, thin or membranous, acuminate at the apex, strongly auriculate-clasping at the base, roughish above, pubescent beneath, usually narrowed below the middle, sometimes 6′ long; heads usually numerous, 1′–2′ broad, panicled, or somewhat racemose on the branches; bracts of the involucre lanceolate, glabrate, rather loose, with herbaceous tips; rays numerous, purple-blue.

In woods and thickets, New York to Ohio, North Carolina and Tennessee. Aug.–Sept.

26. Aster Nòvae-Angliae L. New England Aster. (Fig. 3760.)

Aster Novae-Angliae L. Sp. Pl. 875. 1753.
A. roseus Desf. Cat. Hort. Paris, Ed. 3, 401. 1812.

Stem stout, hispid pubescent, corymbosely branched above, 2°–8° high, very leafy. Leaves lanceolate, entire, rather thin, acute, pubescent, 2′–5′ long, 6″–12″ wide, clasping the stem by an auriculate or broadly cordate base; heads numerous, 1′–2′ broad, clustered at the ends of the branches; involucre hemispheric, its bracts linear-subulate, somewhat unequal, green, spreading, pubescent and more or less glandular, viscid; rays 40–50, linear, 5″–8″ long, violet-purple, rarely pink or red, or white; achenes pubescent; pappus reddish-white.

In fields and along swamps, Quebec to the Northwest Territory, south to South Carolina, Missouri, Kansas and Colorado. One of the most beautiful of the genus. Aug.–Oct.

27. Aster oblongifòlius Nutt. Aromatic Aster. (Fig. 3761.)

Aster oblongifolius Nutt. Gen. 2: 156. 1818.
Aster oblongifolius var. *rigidulus* A. Gray, Syn. Fl. 1. Part 2, 179. 1884.

Stem much branched, hirsute-pubescent, 1°–2½° high, the branches divaricate or ascending. Leaves crowded, oblong, or oblong-lanceolate, sessile by a broad, partly clasping base, usually rigid, entire, acute or mucronulate at the apex, rough or hispidulous on both sides, rough-margined, those of the stem 1′–2′ long, 2″–4″ wide, those of the branches gradually smaller; heads corymbose, nearly 1′ broad; involucre hemispheric, its bracts much imbricated, glandular, aromatic, linear or linear-oblong, the acute green tips spreading; rays 20–30, violet-purple, rarely rose-pink, 3″–5″ long; pappus light brown; achenes canescent.

On prairies and bluffs, central Pennsylvania to Minnesota and Nebraska, south to Virginia, Tennessee and Texas. Plant odorous. Aug.–Oct.

28. Aster amethýstinus Nutt. Amethyst Aster. (Fig. 3762.)

Aster amethystinus Nutt. Trans. Am. Phil. Soc. (II) 7: 294. 1841.

Resembles the preceding species, but is often taller, sometimes 5° high. Leaves often crowded, linear-lanceolate, entire, rough or hispidulous on both sides, partly clasping at the sessile base, acute at the apex, those of the stem 1′–2′ long, 2″–3″ wide; heads rather numerous, racemose or corymbose, ½′–1′ broad; involucre broadly turbinate, its bracts much imbricated, linear, hispid, not glandular, the acutish green tips spreading; rays 20–30, blue-purple, about 3″ long; pappus brown; achenes canescent.

In moist soil, Massachusetts to southern New York, eastern Pennsylvania, Illinois and Iowa. Sept.–Oct.

29. Aster màjor (Hook.) Porter. Great Northern Aster. (Fig. 3763.)

Aster Unalaschensis var. *major* Hook. Fl. Bor. Am. 2: 7. 1834.
Aster modestus Lindl.; Hook, loc. cit. 8. 1834.
Aster majus Porter, Mem. Torr. Club, 5: 325. 1894.

Stem stout, leafy to the summit, usually densely pilose-pubescent with many-celled hairs, rarely glabrate, branched above, 4°–6° high. Leaves membranous, lanceolate, partly clasping by a narrowed base, acuminate at the apex, sharply serrate with low distant teeth, dark green and slightly pubescent above, villous-pubescent on the veins beneath, 3′–5′ long, 5″–10″ wide; heads mostly solitary at the ends of short branches, 1½′ broad; involucre hemispheric, its bracts little imbricated, green, linear-subulate, densely glandular; rays 35–45, purple, 5″–7″ long; achenes appressed-pubescent; pappus tawny.

In moist soil, western Ontario to Dakota, Oregon and British Columbia. Sept.–Oct.

30. Aster puníceus L. Red-stalk or Purple-stem Aster. (Fig. 3764.)

Aster puniceus L. Sp. Pl. 875. 1753.

Stem usually stout, reddish, corymbosely or racemosely branched above, hispid with rigid hairs, 3°–8° high. Leaves lanceolate to oblong-lanceolate, acuminate, sessile and clasping by a broad or narrowed base, sharply serrate, or some of them entire, usually very rough above, pubescent on the midrib beneath, 3′–6′ long, ½′–1½′ wide; heads generally numerous, 1′–1½′ broad; involucre nearly hemispheric, its bracts linear or oblong, attenuate, imbricated in about 2 series, glabrous or ciliate, green, loose, spreading, nearly equal, sometimes broadened; rays 20–40, violet-purple or pale, 5″–7″ long, showy; pappus nearly white; achenes pubescent.

In swamps, Nova Scotia to western Ontario and Minnesota, south to North Carolina, Ohio and Michigan. Called also Early Purple Aster, Swanweed, Cocash, Meadow Scabish. July–Nov.

Aster puniceus firmus (Nees) T. & G. Fl. N. A. 2: 141. 1841.

Aster firmus Nees, Syn. Ast. 25. 1818.
Aster puniceus var. *laevicaulis* A. Gray, Syn. Fl. 1: Part 2, 195. 1884.

Stem sparingly hispid, or glabrous, 2°–5° high; leaves sharply serrate. With the type.

Aster puniceus lucidulus A. Gray, Syn. Fl. 1: Part 2, 195. 1884.
Aster lucidus Wender. Flora, 12: Part 1, Ergbl. 23. 1829. Not Moench 1802.
Stem nearly or quite glabrous; leaves crowded, entire, or nearly so, thin, glabrous or slightly rough-pubescent. Quebec to New England, Ontario and Michigan.

31. Aster tardiflòrus L. Northeastern Aster. (Fig. 3765.)

Aster tardiflorus L. Sp. Pl. Ed. 2, 1231. 1763.

Stem glabrous, or slightly pubescent above, corymbosely branched near the summit, 1°–3° high. Leaves lanceolate or oblong-lanceolate, serrate with low teeth, or some of them entire, acuminate at the apex, narrowed into a clasping base, glabrous or nearly so on both sides, roughish-margined, 3′–6′ long, 4″–10″ wide; heads about 1′ broad, not very numerous, involucre hemispheric, its outer bracts broad and foliaceous, often 6″ long, acute, somewhat unequal; rays 20–30, violet; pappus nearly white; achenes pubescent.

Along streams, Massachusetts to Labrador. Closely related to the preceding species. Aug.-Oct.

32. Aster pátulus Lam. Spreading Aster. (Fig. 3766.)

Aster patulus Lam. Encycl. 1: 308. 1783.

Pubescent, or nearly glabrous; stem 1°–4° high. Leaves oval, ovate, or oblong-lanceolate, sharply and irregularly serrate, rather thin, acute, acuminate, or blunt at the apex, the lower 3′–6′ long, 1′–2½′ wide, narrowed into margined petioles, the upper sessile and somewhat clasping; heads numerous, panicled, about 1′ broad; involucre campanulate, 3″–4″ high, its bracts linear to linear-lanceolate, acuminate, not foliaceous, loosely imbricated in 3 or 4 series, the outer shorter than the inner; rays violet-purple or rarely white.

New Brunswick to New Hampshire. Also called Smooth Red-stem Aster. Sept.

33. Aster prenanthoìdes Muhl. Crooked-stem Aster. (Fig. 3767.)

Aster prenanthoides Muhl.; Willd. Sp. Pl. 3: 2046. 1804.

Stem glabrous, or pubescent in lines above, flexuous, much branched, 1°–2° high. Leaves thin, oblong to ovate-lanceolate, sharply and coarsely serrate, scabrous above, glabrous or nearly so beneath, 3′–6′ long, 9″–18″ wide, acuminate at the apex, abruptly narrowed below into a broad margined entire petiole, the base auriculate-clasping; heads usually numerous, 1′ broad or more; involucre hemispheric, its bracts linear, acute, green, spreading, imbricated in 3 or 4 series, the outer shorter; rays 20–30, violet, 4″–6″ long; pappus tawny; achenes pubescent.

In moist soil, Massachusetts to Wisconsin, south to West Virginia, Kentucky and Iowa. Aug.-Oct.

Aster prenanthoìdes porrectifòlius Porter, Mem. Torr. Club, 5: 326. 1894.
Leaves narrowly lanceolate, much elongated, sometimes 8′ long, gradually contracted into an entire clasping base. Pennsylvania.

34. Aster laèvis L. Smooth Aster. (Fig. 3768.)

Aster laevis L. Sp. Pl. 876. 1753.

Stem usually stout, glabrous, often glaucous, 2°–4° high, branched or simple. Leaves thick, entire, or serrate, glabrous, slightly rough-margined, the upper all sessile and strongly cordate-clasping, oblong-lanceolate, oblanceolate or ovate, acute or obtusish, 1′–4′ long, 4″–2′ wide, the basal and lower gradually narrowed into winged petioles, those of the branches often small and bract-like; heads usually numerous, about 1′ broad; involucre campanulate, its bracts rigid, acute, appressed, green-tipped, imbricated in several series; rays 15–30, blue or violet; pappus tawny; achenes glabrous or nearly so.

Usually in dry soil, Maine and Ontario to Pennsylvania and Louisiana, west to the Northwest Territory and Missouri. Sept.-Oct.

Aster laèvis amplifòlius Porter, Mem. Torr. Club, 5: 324. 1894.

Stout, somewhat fleshy; leaves broadly ovate, narrowed toward the base, strongly clasping. Massachusetts to eastern Pennsylvania, Minnesota and Missouri.

Aster laèvis Potomacénsis Burgess.

Lower stem-leaves abruptly contracted into winged petioles, sharply serrate; heads few, usually racemose; green tips of the bracts broad, conspicuous. Maryland and Virginia.

35. Aster concínnus Willd. Narrow-leaved Smooth Aster. (Fig. 3769.)

Aster concinnus Willd. Enum. 884. 1809.

Similar to narrow-leaved forms of *Aster laevis*, glabrous, or sparingly pubescent above; stem paniculately branched, 1°–3° high. Leaves light green, lanceolate to linear, entire, or sometimes serrulate, the upper sessile, somewhat clasping, 1′–3′ long, the lower and basal ones spatulate, or oblong, narrowed into margined petioles, sometimes coarsely toothed; heads usually numerous, about 1′ broad; bracts of the involucre with rhomboid acute herbaceous tips; rays violet to purple.

New York and Pennsylvania to Virginia, North Carolina (?) and Arkansas.

36. Aster purpuràtus Nees. Southern Smooth Aster. (Fig. 3770.)

Aster virgatus Ell. Bot. S. C.& Ga. 2: 353. 1824. Not Moench, 1802.

A. purpuratus Nees, Gen. & Sp. Ast. 118. 1832.

Stem slender, glabrous, simple, or branched above, 1½°–3° high, the branches sometimes puberulent. Leaves firm, glabrous, dark green, entire, the upper sessile and clasping at the base, elongated-lanceolate or linear-lanceolate, acuminate, 2′–6′ long, 2″–4″ wide, the lower and basal ones petioled, oblong-lanceolate, obtusish, those of the branches very small; heads rather few, loosely paniculate, 8″–12″ broad; involucre campanulate, to turbinate, its bracts coriaceous, linear, appressed, green-tipped, acute, imbricated in several series, the outer shorter; rays 5–10, blue or violet, 3″–5″ long, pappus tawny; achenes glabrous.

Virginia and West Virginia to Georgia and Texas. Aug.–Sept.

37. Aster júnceus Ait. Rush Aster. (Fig. 3771.)

Aster junceus Ait. Hort. Kew. 3: 204. 1789.

Stem very slender, glabrous, or minutely pubescent above, simple or little branched, 1°–3° high. Leaves firm, glabrous, narrowly linear, entire, or sometimes with a few distant teeth, acute or acuminate at the apex, sessile by a broad clasping and often slightly cordate base, 3′–6′ long, 1½″–4″ wide; heads paniculate, rather distant, about 1′ broad; involucre hemispheric, about 3″ high, its bracts glabrous, linear-subulate, very acute, imbricated in 3 or 4 series, the outer shorter; rays violet to nearly white, 4″–5″ long; pappus pale.

In swamps and bogs, Nova Scotia to the Northwest Territory, south to New Jersey, Ohio, Wisconsin and in the Rocky Mountains. July–Sept.

38. Aster adscéndens Lindl. Western Aster. (Fig. 3772.)

A. adscendens Lindl.; Hook. Fl. Bor. Am. 2: 8. 1834.

Stem slender, rigid, glabrous, or sparingly hirsute-pubescent, branched or simple, 6′–2° high. Leaves firm, entire, rough-margined, sometimes ciliolate, those of the stem linear-lanceolate or linear-oblong, acute or obtusish, 1′–3′ long, 2″–5″ wide, sessile by a more or less clasping base; basal leaves spatulate, narrowed into short petioles; heads not numerous, about 1′ broad; involucre hemispheric, its bracts imbricated in 3–5 series, oblong-linear or spatulate, their tips obtuse or obtusish, slightly spreading, the inner often mucronulate; pappus nearly white; achenes pubescent.

On prairies and moist banks, western Nebraska to Wyoming, Montana and the Northwest Territory, west to Colorado, New Mexico and Nevada. July–Sept.

39. Aster Nòvi-Bélgii L. New York Aster. (Fig. 3773.)

Aster Novi-Belgii L. Sp. Pl. 877. 1753.
Aster longifolius A. Gray, Man. Ed. 5, 233. 1867. Not Lam. 1783.

Stem slender, usually much branched, glabrous, or slightly pubescent above, 1°–3° high. Leaves lanceolate, oblong-lanceolate, or linear-lanceolate, firm, entire, or slightly serrate, glabrous, or very nearly so, acuminate at the apex, narrowed, sessile and more or less clasping at the base, 2′–5′ long, 3″–8″ wide, the lowest petioled; heads corymbose-paniculate, usually numerous, 10″–15″ broad; involucre hemispheric, to campanulate, its bracts linear, acute, green, somewhat spreading, in 3–5 series, the outer shorter; rays 15–25, violet, 4″–5″ long; pappus whitish; achenes glabrous or nearly so.

In swamps, Newfoundland to Maine and Georgia, mainly near the coast. Aug.–Oct.

Aster Nòvi-Bélgii litòreus A. Gray, Syn. Fl. 1: Part 2, 189. 1884.

Low and spreading, more or less fleshy, much branched; leaves shorter, broader, thickish, acute, 1′–2½′ long; principal bracts of the involucre, obtuse, loose, spatulate. Along salt-marshes, Prince Edward Island and Quebec to Georgia.

Aster Nòvi-Bélgii elòdes (T. & G.) A. Gray, Syn. Fl. 1: Part 2, 190. 1884.

Aster elodes T. & G. Fl. N. A. 2: 136. 1841.

Leaves narrowly linear-lanceolate, often elongated to 4–6 inches; bracts of the involucre acute. In moist ground, southern New York to North Carolina. Probably specifically distinct.

Aster Nòvi-Bélgii Atlánticus Burgess.

Leaves lanceolate, tapering from the middle to an acuminate base and apex, sometimes 1′ wide;

heads usually fewer; inflorescence racemose-corymbose. In shaded swamps, Massachusetts to North Carolina.

Aster Nòvi-Bèlgii Brittònii Burgess.

Leaves thick; heads short-peduncled, racemose-spicate toward the ends of the branches; green tips of the bracts short. Massachusetts to southeastern New York and Virginia, near the coast.

40. Aster longifòlius Lam. Long-leaved Aster. (Fig. 3774.)

Aster longifolius Lam. Encycl. 1: 306. 1783.

Stem glabrous, or somewhat pubescent, leafy, paniculately branched, 1°–3° high. Leaves lanceolate to linear-lanceolate, entire or nearly so, acuminate at the apex, narrowed into a sessile clasping usually slightly cordate base, 3′–8′ long, 2″–6″ wide; heads rather numerous, about 1′ broad; involucre hemispheric, 4″–5″ high, its bracts glabrous, narrow, green, acute, imbricated in only 1 or 2 series, nearly equal; rays numerous, about 4″ long, violet or pale purple; pappus pale.

In swamps and moist ground, Labrador to the Northwest Territory, south to northern New England, Ontario and Montana. Summer.

Aster longifòlius villicàulis A. Gray, Syn. Fl. 1: Part 2, 189. 1884.

Stem densely white-villous; leaves narrowly linear-lanceolate, the mid-rib villous beneath; heads fewer, long-peduncled; rays dark violet. Northern Maine and New Brunswick.

41. Aster foliàceus Lindl. Leafy-bracted Aster. (Fig. 3775.)

Aster foliaceus Lindl. in DC. Prodr. 5: 228. 1835.

Stem usually stout, sparingly pubescent in lines, 2°–3° high, branched above, the branches ascending. Leaves rather thin, oblong-lanceolate, acute at the apex, entire, or with a few small distant teeth, glabrous on both sides, very rough-margined, 2′–4′ long, ½′–1′ wide, the upper all strongly clasping at the base, the lowest petioled; heads corymbose-paniculate, numerous, 1′ broad or more; involucre hemispheric, its bracts green, foliaceous, oblong, mucronate, the inner mostly narrower and acute; rays about 30, violet, 4″–5″ long; pappus nearly white; achenes pubescent.

Kimball Co., Nebraska (Rydberg). August. As recognized by Dr. Gray, this species comprises several varieties, widely distributed in the Rocky Mountains and extending west to the Pacific. Our description and figure are drawn from Mr. Rydberg's specimens.

42. Aster seríceus Vent. Western Silvery or Silky Aster. (Fig. 3776.)

Aster sericeus Vent. Hort. Cels, *pl. 33.* 1800.
Aster argenteus Michx. Fl. Bor. Am. 2: 111. 1803.

Stem slender, paniculately or corymbosely branched, stiff, glabrous, leafy, 1°–2° high. Stem leaves sessile, with a broad base, oblong, entire, mucronate, ½′–1½′ long, 2″–5″ wide, erect or ascending, with a dense silvery-white silky pubescence on both sides; basal and lowest leaves oblanceolate, narrowed into margined petioles; heads numerous, about 1½′ broad; involucre turbinate, its bracts oblong, or the inner lanceolate, canescent, imbricated in 3 or 4 series, their tips green, acute, spreading; rays 15–25, violet-blue, 6″–8″ long; pappus tawny; achenes glabrous.

In dry open soil, Illinois to Minnesota and Manitoba, south to Tennessee, Missouri and Texas. Aug.–Sept.

43. Aster cóncolor L. Eastern Silvery Aster. (Fig. 3777.)

Aster concolor L. Sp. Pl. Ed. 2, 1228. 1763.

Stem slender, glabrous, or pubescent above, 1°–2½° high, leafy, simple, or with few erect branches. Leaves oblong or linear-oblong, finely and densely canescent on both sides, or the lower glabrate, sessile, obtuse or mucronate, 1½′–2′ long; heads numerous in an elongated narrow raceme resembling *Lacinaria;* involucre broadly turbinate, its bracts linear or linear-oblong, appressed, canescent, imbricated in 4 or 5 series, their tips green, acute, the outer shorter; rays 10–15, lilac, 3″–4″ long; pappus tawny; achenes villous.

In dry sandy soil, eastern Massachusetts and Rhode Island to Florida and Louisiana, near the coast. Lilac-flowered Aster. Aug.–Oct.

44. Aster Féndleri A. Gray. Fendler's Aster. (Fig. 3778.)

Aster Fendleri A. Gray, Mem. Am. Acad. (II) 4: 66. 1849.

Aster Nuttallii var. *Fendleri* A. Gray, Pac. R. R. Rep. 4: 97. 1856.

Stems several or solitary from thick woody roots, rigid, hirsute, 6′–12′ high. Leaves linear, rigid, 1-nerved, acute or acuminate, 8″–15″ long, 1″–1½″ wide, glabrous on both sides, but the margins bristly-ciliate; heads usually few and racemose, ½′–1′ broad; involucre turbinate, its bracts glandular, linear-oblong, imbricated in about 4 series, the inner acute, the outer shorter and obtuse; rays 10–15, violet, 3″–5″ long.

In dry soil on the plains, western Kansas to Colorado and New Mexico. Aug.–Sept.

45. Aster grandiflòrus L. Large-flowered Aster. (Fig. 3779.)

Aster grandiflorus L. Sp. Pl. 877. 1753.

Stem rather stiff, divaricately much branched, hispid with short hairs, 1°–2½° high. Leaves oblong, linear, or somewhat spatulate, rigid, sessile by a broad, sometimes slightly clasping base, reflexed, entire, obtusish, hispid, the larger 2′ long and 4″ wide, those of the branches very numerous, 2″–5″ long; heads about 2′ broad, terminating the branches; involucre hemisphcric, its bracts very squarrose and foliaceous, imbricated in 5–7 series, linear, or linear-oblong, glandular, the outer obtusish, the inner acute; rays very numerous, deep violet, nearly 1′ long, 1½″ wide; pappus brownish; achenes ribbed, canescent.

In dry soil, Virginia, east of the mountains, to Florida. Sept.

46. Aster spectábilis Ait. Low Showy Aster. Seaside Purple Aster. (Fig. 3780.)

Aster spectabilis Ait. Hort. Kew. 3: 209. 1789.

Stem stiff, simple, or corymbosely branched above, puberulent, or rough below, more or less glandular above, 1°–2° high. Leaves firm, thickish, the basal and lower ones oval, acute or acutish, 3′–5′ long, 1′–1½′ wide, sparingly dentate with low teeth, narrowed at the base into slender petioles; upper leaves sessile, entire or very nearly so, acute, linear-oblong; heads several or numerous, about 1½′ broad, corymbose, very showy; involucre nearly hemispheric, its bracts linear-oblong or slightly spatulate, glandular, imbricated in about 5 series, their green obtusish tips spreading; rays 15–30, bright violet, 6″–10″ long; pappus whitish; achenes slightly pubescent.

In dry sandy soil, Massachusetts to Delaware, mostly near the coast. Aug.–Oct.

48. Aster grácilis Nutt. Slender or Tuber Aster. (Fig. 3782.)

Aster gracilis Nutt. Gen. 2: 158. 1818.

Stem slender, finely puberulent and scabrous, corymbosely branched above, 1°–1½° high. Leaves minutely scabrous, the basal and lower ones oval, acute or obtusish, 2′–3′ long, 4″–8″ wide, dentate, narrowed into slender petioles; upper leaves linear, linear-oblong, or slightly oblanceolate, acute, entire, sessile or a little clasping; heads usually numerous, 6″–10″ broad; involucre narrowly turbinate, its bracts coriaceous, glabrous or very nearly so, imbricated in about 5 series, their tips green and spreading, obtusish; rays 9–15, violet, 3″–4½″ long; pappus nearly white; achenes minutely pubescent.

In dry sandy soil, New Jersey to Kentucky, Tennessee and North Carolina. Rootstock tuberous-thickened. July–Sept.

47. Aster surculòsus Michx. Creeping Aster. (Fig. 3781.)

Aster surculosus Michx. Fl. Bor. Am. 2: 112. 1803.

Stem slender, from elongated-filiform rootstocks, minutely scabrous-pubescent, 10′–18′ high, corymbosely branched above. Leaves firm, lanceolate or linear, the lower petioled, 2′–3′ long, 4″–8″ wide, rough-margined, slightly scabrous above, sparingly dentate, the upper narrower, sessile, entire; heads few, or sometimes solitary, about 15″ broad; involucre turbinate-hemispheric, its bracts coriaceous, imbricated in about 5 series, ciliate, but scarcely glandular, their green tips spreading; rays 15–30, violet; pappus whitish; achenes nearly glabrous.

In sandy or gravelly soil, North Carolina and Georgia. Reported from New Jersey. Sept.–Oct.

49. Aster Rádula Ait. Low Rough Aster. File-blade Aster. (Fig. 3783.)

Aster Radula Ait. Hort. Kew. 3: 210. 1789.

Stem glabrous, or puberulent above, slender, corymbosely branched near the summit, 1°–2° high. Leaves sessile, rough above, more or less pubescent beneath, oblong-lanceolate, acute, sharply serrate, strongly pinnately veined, 2′–3′ long, 3″–12″ wide; heads several, or sometimes numerous, 1′–1½′ broad; involucre hemispheric, its bracts oblong or oblong-spatulate, coriaceous, appressed-pubescent, conspicuously ciliolate, their green obtuse tips appressed; rays 20–30, violet, 4″–6″ long; achenes glabrous, striate; pappus nearly white.

In swamps, Delaware and southern Pennsylvania to Newfoundland. July-Sept.

Aster Rádula biflórus (Michx.) Porter, Mem. Torr. Club, 5: 326. 1894.

Aster biflorus Michx. Fl. Bor. Am. 2: 114. 1803.
Aster strictus Pursh. Fl. Am. Sept. 556. 1814.
Aster Radula var. *strictus* A. Gray, Syn. Fl. 1: Part 2, 176. 1884.

Lower, very slender; heads 1–3; leaves narrower, less serrate or entire; involucral bracts, or some of them acute. Mountains of New England to Labrador and Newfoundland. Perhaps a distinct species.

50. Aster Hérveyi A. Gray. Hervey's Aster. (Fig. 3784.)

Aster Herveyi A. Gray, Man. Ed. 5, 229. 1867.

Stem roughish, at least above, slender, simple or corymbosely branched, rarely paniculate, 1°–3° high, the branches glandular-puberulent. Leaves firm, rough above, pubescent on the veins beneath, the basal and lower ones on slender naked petioles, ovate, dentate with low usually distant teeth, acute at the apex, narrowed, rounded or rarely cordate at the base, 2′–6′ long, 1′–3′ wide; upper leaves sessile, or narrowed into winged petioles, smaller, entire or nearly so; heads 1′–1½′ broad; involucre turbinate or campanulate, its bracts appressed, or sometimes spreading, densely glandular, oblong or spatulate, obtuse or mucronulate; rays 15–25, violet, 5″–7″ long; achenes minutely pubescent, striate; pappus nearly white.

In dry soil, eastern Massachusetts and Rhode Island. Apparently hybridizes with *A. spectabilis*. Aug.-Oct.

51. Aster turbinéllus Lindl. Prairie Aster. (Fig. 3785.)

Aster turbinellus Lindl. Comp. Bot. Mag. 1: 98. 1835.

Stem slender, paniculately branched, glabrous below, puberulent above, 2°–3° high. Leaves firm, lanceolate, or oblong-lanceolate, entire, ciliate, acute or acuminate, 2′–3′ long, the lower and basal ones petioled, the upper sessile, those of the branches much smaller; heads about 1′ broad, mostly solitary at the ends of the branches; involucre turbinate, its bracts oblong, coriaceous, obtuse, appressed, imbricated in 5 or 6 series, their tips green only at the apex; rays 10–20, 3″–5″ long, violet; pappus tawny; achenes finely pubescent.

In dry soil, especially on prairies, Illinois to Missouri, Kansas, Louisiana and Arkansas. Sept.-Oct.

52. Aster Nebraskénsis Britton. Nebraska Aster. (Fig. 3786.)

Stem strictly erect, slender, stiff, rough to the base, simple, or with a few short nearly erect branches, very leafy, 1½°–2½° tall. Leaves thick, rather rigid, ascending, lanceolate to oblong-lanceolate, sessile by a subcordate base, acute or acuminate at the apex, 1′–3′ long, 4″–6″ wide; very rough on both sides, the midvein prominent beneath, the lateral veins obscure; heads few, terminating short leafy branchlets, 1′–1¼′ broad; involucre broadly campanulate or hemispheric, about 3″ high, its bracts green, oblong, acute, imbricated in several series, the outer quite foliaceous; rays purple, about 6″ long.

Lake shores, central Nebraska. Sept. Lower and basal leaves not seen. Type, Rydberg, No. 1724, 1893, "in the lake region of Grant Co., 2 miles northwest of Whitman."

53. Aster paludòsus Ait. Southern Swamp Aster. (Fig. 3787.)

Aster paludosus Ait. Hort. Kew. 3: 201. 1789. *Heleastrum paludosum* DC. Prodr. 5: 264. 1836.

Stem roughish, or rough-pubescent, slender, simple, or somewhat branched above, 1°–2½° high. Leaves linear, entire, glabrous, the margins rough or ciliate, rather rigid, 2′–6′ long, 2″–4″ wide, mostly 1-nerved, acute, the lower part commonly sheathing the stem; heads few or several, racemose or paniculate, 1½′–2′ broad; involucre broadly campanulate or hemispheric, its bracts imbricated in about 5 series, foliaceous, ciliate, the outer lanceolate, acute, the inner oblong or spatulate; rays 20–30, deep violet, 5″–7″ long, pappus tawny; achenes 8–10-nerved, glabrous or nearly so.

In swamps, Missouri to Texas, east to North Carolina and Florida. Aug.–Oct.

54. Aster nemoràlis Ait. Bog Aster. (Fig. 3788.)

Aster nemoralis Ait. Hort. Kew. 3: 198. 1789.

Stem puberulent, slender, simple, or corymbosely branched above, 6′–2° high. Leaves sessile, membranous, oblong-lanceolate or linear-oblong, acute at each end, pubescent or puberulent on both sides, dentate or entire, 1′–2′ long, 1½″–4″ wide, margins often revolute; heads several, or solitary, 1′–1½′ broad, the peduncles slender; involucre hemispheric, its bracts appressed, linear-subulate, acute or acuminate, imbricated in about 3 series; rays 15–25, light violet-purple to rose-pink; achenes glandular-pubescent; pappus white.

In sandy bogs, New Jersey to northern New York, Ontario, Newfoundland and Hudson Bay. Aug.–Sept.

Aster nemoràlis Blàkei Porter, Bull. Torr. Club, 21: 311. 1894.

Stems 1°–2½° high, ascending, leafy from the base; leaves 2″–3½′ long, 5″–1′ wide, oblong-lanceolate, remotely and sharply dentate, or nearly entire; heads rather few, sometimes solitary. Maine, New Hampshire and northern New York. Forms resemble the following species.

55. Aster acuminàtus Michx. Whorled or Mountain Aster. (Fig. 3789.)

Aster divaricatus Lam. Encycl. 1: 305. 1783. Not L. 1753.
Aster acuminatus Michx. Fl. Bor. Am. 2: 109. 1803.

Stem pubescent or puberulent, zigzag, corymbosely branched, often leafless below, 1°–3° high. Leaves thin, broadly oblong, acuminate at the apex, narrowed to a somewhat cuneate sessile base, sharply and coarsely dentate, pinnately veined, glabrous or pubescent above, pubescent at least on the veins beneath, 3′–6′ long, ½′–1½′ wide, often approximate above, and appearing whorled; heads several or numerous, 1′–1½′ broad; involucre nearly hemispheric, its bracts subulate-linear, acuminate, the outer much shorter; rays 12–18, narrow, 6″–8″ long, white or purplish; pappus soft, fine, nearly white; achenes pubescent.

Moist woods, Labrador to Ontario, western New York, and in the mountains to Georgia. July–Oct.

56. Aster ptarmicoìdes (Nees) T. & G. Upland White Aster. (Fig. 3790.)

Chrysopsis alba Nutt. Gen. 2: 152. 1818. Not *A. albus* Willd.
Doellingeria ptarmicoides Nees, Gen. & Sp. Ast. 183. 1832.
A. ptarmicoides T. & G. Fl. N. A. 2: 160. 1841.

Stems tufted, slender, rigid, usually rough above, corymbosely branched near the summit, 1°–2° high. Leaves linear-lanceolate, 3-ribbed, entire, or with a few distant teeth, firm, shining, rough-margined or ciliate, sometimes scabrous, acute, narrowed to a sessile base, or the lower petioled, the lowest and basal ones 3′–6′ long, 2″–4″ wide, the upper smaller, those of the branches linear-subulate; heads not numerous, 8″–12″ broad, terminating the branches of the corymb; involucre nearly hemispheric, 2″–3″ high, its bracts linear-oblong, obtuse, appressed, nearly glabrous, green, imbricated in about 4 series; rays 10–20, snow white, 3″–4″ long; pappus white; achenes glabrous.

In dry or rocky soil, Massachusetts, Vermont and Ontario, to the Northwest Territory, Illinois, Missouri and Colorado. July–Sept.

Aster ptarmicoìdes lutèscens (Hook.) A. Gray, Syn. Fl. 1: Part 2, 199. 1884.
Diplopappus albus var. *lutescens* Hook. Fl. Bor. Am. 2: 21. 1834.

Rays pale yellow, short; involucre narrower. Northern Illinois to the Northwest Territory.

57. Aster dumòsus L. Bushy Aster. Rice-button Aster. (Fig. 3791.)

Aster dumosus L. Sp. Pl. 873. 1753.

Glabrous or very nearly so throughout, paniculately much branched, 1°–3° high. Leaves firm, those of the stem linear or linear-lanceolate, entire, acute, or obtusish, 1′–3′ long, 1½″–3″ wide, roughish-margined, often reflexed, those of the branches very numerous, small and bract-like, the basal ones spatulate, dentate; heads 4″–7″ broad, terminating the usually divergent slender branches and branchlets, usually numerous; involucre broadly campanulate, its bracts linear-subulate, obtuse or acutish, appressed, imbricated in about 4 series, green-tipped; rays 15–30, white to pale violet, 2″ long, pappus white; achenes minutely pubescent.

Sandy soil, Massachusetts to western New York, Ontario, Florida, Louisiana and Missouri. Aug.-Oct.

Aster dumòsus coridifòlius (Michx.) T. & G. Fl. N. A. 2: 128. 1841.
Aster coridifolius Michx.; Willd. Sp. Pl. 3. 2028. 1804.

More rigid and stouter; branchlets elongated; bracts of the involucre coriaceous; leaves of the branches small and numerous, very close, divergent. Pine-barrens, Martha's Vineyard to Florida.

Aster dumòsus strictior T. & G. Fl. N. A. 2: 128. 1841.

Stem sparingly branched, the branches ascending, terminated by rather larger heads; leaves sessile by a broad base, acuminate, mostly quite entire. Swamps, Massachusetts to New Jersey, Pennsylvania and Maryland.

58. Aster salicifòlius Lam. Willow Aster. (Fig. 3792.)

Aster salicifolius Lam. Encycl. 1: 306. 1783.
Aster carneus T. & G. Fl. N. A. 2: 133. 1841.

Stem rather slender, paniculately much branched, usually very leafy, 2°–5° high, glabrous, or somewhat pubescent above. Leaves firm, lanceolate or linear-lanceolate, rough-margined, acute or acuminate at the apex, narrowed and sessile or slightly clasping at the base, entire or sparingly dentate with low teeth, glabrous or nearly so, 2′–4′ long, 2″–6″ wide, the lowest sometimes petioled, those of the branches gradually smaller; heads numerous, 8″–12″ broad; involucre broadly turbinate, its bracts linear-oblong, appressed, imbricated in 4 or 5 series, their green tips acute or obtusish; rays numerous, violet, or violet-purple, or sometimes white, 3″–4″ long; pappus white; achenes minutely pubescent.

In moist soil, Maine and Ontario to Massachusetts and Florida, west to Montana, Missouri and Texas. Intergrades with *A. paniculatus*. Aug.–Oct.

Aster salicifòlius subásper (Lindl.) A. Gray, Syn. Fl. 1: Part 2: 188. 1884.
Aster subasper Lindl. Comp. Bot. Mag. 1: 97. 1835.

Stem scabrous; leaves more or less so. Indiana to Missouri and Texas.

Aster salicifòlius stenophýllus (Lindl.) Burgess.
Aster stenophyllus Lindl., DC. Prodr. 5: 242. 1836.

Leaves narrowly linear-lanceolate, small, those of the branches numerous and minute; bracts of the involucre linear-subulate. Southern New York and eastern Pennsylvania to Virginia.

59. Aster paniculàtus Lam. Tall White or Panicled Aster. (Fig. 3793.)

Aster paniculatus Lam. Encycl. 1: 306. 1783.

Stem glabrous or nearly so, pauiculately much branched, 2°–8° high. Leaves lanceolate to oblong-lanceolate, acuminate at the apex, narrowed to a sessile or slightly clasping base, glabrous, usually thin, roughish-margiued, those of the stem sparingly serrate in the middle, or sometimes very nearly entire, 3′–6′ long, 3″–6″ wide, the upper and those of the branches gradually smaller; heads numerous, 8″–10″ broad; involucre nearly hemispheric, 3″–4″ high, its bracts narrowly linear-lanceolate, acute or acumiuate, appressed, green-tipped, imbricated in 4 or 5 series; rays numerous, white, or faintly tinged with violet, 3″–4″ long; pappus white or nearly so; achenes minutely pubescent.

In moist soil, New Brunswick to western Ontario and Montana, south to New Jersey, Virginia, Kentucky, Louisiana and Missouri. Aug.–Oct.

Aster paniculàtus bellidiflòrus (Willd.) Burgess.
Aster bellidiflorus Willd. Enum. 886. 1809.
Aster tenuifolius var. *bellidiflorus* T. & G. Fl. N. A. 2: 132. 1841.

Leaves narrowly linear, acuminate at both ends, entire, or remotely appressed-serrate, chiefly 4′ long by 3″ wide, or less; heads numerous, rather densely clustered on the ascending branches of the large panicle. In moist or wet soil, in open situations, New Brunswick to western Ontario, North Carolina, Missouri and Kansas.

Aster paniculàtus simplex (Willd.) Burgess.
Aster simplex Willd. Enum. 887. 1809.

Leaves oblong-lanceolate to oblanceolate, thin, long-acuminate at both ends, the larger often 8′ long and 1′ wide, sparingly serrate with low teeth; inflorescence leafy, the heads less showy than in the preceding. In shaded moist places, Massachusetts to Ohio, Virginia and Kentucky.

Aster paniculàtus acùtidens Burgess.

Aster carneus var. *ambiguus* T. & G. Fl. N. A. 2: 133. 1841. Not *A. ambiguus* Thunb. 1832.

Leaves oblong-lanceolate, the larger often 6′ long by 1¼′ wide, very sharply serrate, at least above the middle; branches often very short, sometimes elongated. Along streams and ditches, Connecticut to Virginia, Ohio and Kansas.

60. Aster Missouriénsis Britton. Missouri Aster. (Fig. 3794.)

Stem densely puberulent or pubescent, at least above, much branched, 2° high or more. Leaves thin, oblong-lanceolate to oblanceolate, acute or acuminate at the apex, sharply serrate above the middle, gradually tapering to an entire sessile or slightly clasping base, or the lower petioled, puberulent above, finely pubescent beneath, the larger 3′–4′ long, the upper much smaller, entire; heads 6″–8″ broad, paniced, short-peduncled, or terminating short leafy branchlets, sometimes somewhat secund; involucre 2″–3″ high, its linear acute bracts well imbricated, ciliate or pubescent; rays white.

In moist soil, Kansas and Missouri. Sept.–Oct.

61. Aster Tradescánti L. Tradescant's Aster. Michaelmas Daisy. (Fig. 3795.)

Aster Tradescanti L. Sp. Pl. 876. 1753.

Stem slender, paniculately branched, 2°–5° high, the branches usually ascending and often pubescent in lines. Stem leaves linear-lanceolate or lanceolate, acuminate at the apex, narrowed to a sessile base, 3′–6′ long, 1½″–6″ wide, glabrous or nearly so on both sides, commonly thin, sharply serrate in the middle with low teeth, or sometimes entire; heads very numerous, racemose but not secund on the branches, 5″–8″ broad; involucre hemispheric to broadly turbinate, 2″–3″ high, its bracts linear, acute, appressed, green-tipped, imbricated in 4 or 5 series; rays white or nearly so, numerous, 2″–3″ long; pappus white; achenes minutely pubescent.

In fields and swamps, Ontario to Virginia, west to the Northwest Territory, Illinois and Minnesota. Extends to Florida? Aug.–Oct.

62. Aster Fáxoni Porter. Faxon's Aster. (Fig. 3796.)

Aster polyphyllus Willd. Enum. 888. 1809. Not Moench, 1802.

Aster Faxoni Porter, Mem. Torr. Club, 5: 323. 1894.

Glabrous throughout; stem paniculately or corymbosely branched; rather stout, 2°–5° high. Stem leaves lanceolate or linear-lanceolate, acute or acuminate, narrowed to a sessile base, or the lower into margined petioles, entire or nearly so, firm, 2′–5′ long, 2″–4″ wide, those of the branches gradually smaller; basal leaves oblong to spatulate, obtuse, dentate, heads not very numerous, 6″–9″ broad; involucre hemispheric, nearly 4″ high, its bracts linear-lanceolate, acute or subulate, green-tipped or green on the back, imbricated in about 3 series, the outer shorter; rays bright white, 3″–4″ long, numerous; pappus white; achenes minutely pubescent.

On moist cliffs, Vermont and Massachusetts to Pennsylvania, west to Wisconsin(?) south to North Carolina (according to Gray). Aug.–Sept.

63. Aster ericoides L. White Heath Aster. Frost-weed Aster. (Fig. 3797.)

Aster ericoides L. Sp. Pl. 875. 1753.

Stem glabrous or very nearly so, paniculately branched, usually bushy, 1°–3° high, the branches racemose, and the branchlets often somewhat secund. Leaves firm or rigid, the basal ones spatulate, obtuse, dentate, narrowed into margined petioles, glabrous or ciliate; stem leaves narrowly linear, acute, entire, 1′–3′ long, 1″–3″ wide, those of the branches linear-subulate, numerous; heads usually very numerous, 4″–6″ broad; involucre campanulate to hemispheric, its bracts coriaceous, lanceolate or linear-lanceolate, abruptly acute or acuminate, green-tipped, imbricated in about 3 series; rays 15–25, white, or tinged with rose; pappus white; achenes finely pubescent.

In dry soil, Maine and Ontario to Florida, west to Wisconsin and Kentucky. Called also Frost-weed, Michaelmas Daisy, Farewell Summer, White Rosemary, Dog-fennel, Mare's-tail, Scrub-bush. Sept.–Dec.

Aster ericoides pilosus (Willd.) Porter, Mem. Torr. Club, 5: 323. 1894.

Aster villosus Michx. Fl. Bor. Am. 2: 113. 1803. Not Thunb. 1800.
Aster ericoides var. *villosus* T. & G. Fl. N. A. 2: 124. 1841.

Stem, branches and often the leaves villous-hirsute or hispid; leaves linear-lanceolate. Western Ontario to Pennsylvania and Georgia, west to Minnesota and Missouri.

Aster ericoides platyphyllus T. & G. Fl. N. A. 2: 124. 1841.

Densely villous-hirsute; stem leaves lanceolate or oblong-lanceolate, 1′–2′ long, 4″–12″ wide. Indiana to North Carolina and Georgia.

Aster ericoides depauperatus Porter, Mem. Torr. Club, 5: 323. 1894.

Aster ericoides var. *pusillus* A. Gray, Syn. Fl. 1: Part 2, 184. 1884. Not *A. pusillus* Horn. 1815.

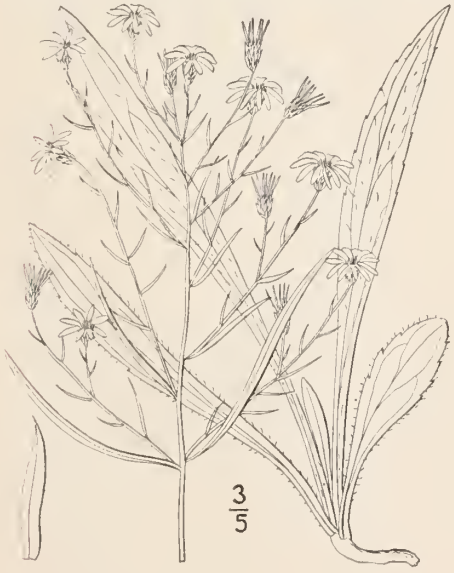
Glabrous, very slender, 6′–12′ high; stem leaves and those of the branches linear or subulate. Southern Pennsylvania and West Virginia.

Aster ericoides Randi Britton.

Low, stout, glabrous, seldom over 1° high, corymbosely or somewhat racemosely branched above, often bushy; stem-leaves elongated, sometimes 3″ wide; basal leaves spatulate, petioled, entire; heads numerous, larger than in the type, sometimes over 1′ broad; rays white to violet; bracts of the involucre greener than in the type. Perhaps a distinct species. Mt. Desert Island, Maine.

Aster ericoides parviceps Burgess.

More or less pilose; stem strict, erect, about 1° high, usually bushy, branched above, the branches mostly short; leaves narrowly linear, ascending, with short leafy branches in their axils; heads numerous, crowded, 3″–4″ broad, somewhat secund; involucre ½″–2″ high; leaves of the branches reduced to small scales. Prairies, Illinois and Missouri.



64. Aster Pringlei (A. Gray) Britton. Pringle's Aster. (Fig. 3798.)

Aster ericoides var. *Pringlei* A. Gray, Syn. Fl. 1: Part 2, 184. 1884.

Stem very slender, glabrous, simple, or with few or numerous slender ascending branches, not bushy, 6′–2° high. Basal leaves lanceolate, oblong or oblanceolate, 2′–6′ long, 2″–6″ wide, entire, or slightly toothed, ciliate and sometimes a little pubescent, at least on the slender petioles which are often as long as the blades; stem leaves narrowly linear, those of the branches small and subulate; heads as large as those of *A. ericoides*, or commonly smaller, usually fewer, solitary at the ends of the branches and branchlets; bracts of the campanulate involucre with short green tips; rays white.

On banks, especially in rocky places, Massachusetts and Vermont to Wisconsin. Aug.–Oct.

65. Aster lateriflòrus (L.) Britton. Starved Aster. Calico Aster. (Fig. 3799.)

Solidago lateriflora L. Sp. Pl. 879. 1753.
Aster diffusus Ait. Hort. Kew. 3: 205. 1789.
Aster miser Nutt. Gen. 2: 158. 1818.
A. lateriflorus Britton, Trans. N. Y. Acad. Sci. 9: 10. 1889.

Stem puberulent, or nearly glabrous, slender, divergently branched, 1°–5° high. Basal leaves ovate, slender-petioled; stem leaves broadly lanceolate or oblong-lanceolate, mostly acuminate, serrate, 2′–5′ long, 6″–12″ wide, those of the branches smaller, oblong or linear-oblong; heads 3″–5″ broad, racemosely unilateral on the branches, short-peduncled or sessile, usually numerous and crowded; involucre turbinate, its bracts linear-oblong, obtuse or acutish, imbricated in about 4 series, their short green tips appressed or slightly spreading; rays numerous, short, white or pale purple; disk-flowers purple; pappus white; achenes minutely pubescent.

In dry or moist soil, Nova Scotia to western Ontario, south to North Carolina, Louisiana and Texas. Called in Maryland Rosemary. Aug.–Oct.

Aster lateriflòrus glomerèllus (T. & G.) Burgess.

Aster miser var. *glomerellus* T. & G. Fl. N. A. 2: 130. 1841.

Chiefly unbranched, with the habit of *Solidago caesia*; leaves hispidulous above, oblong-lanceolate, dull green, the teeth very sharp and straight; heads glomerate in the axils, often somewhat spicate toward the summit of the plant, sometimes also on short branches. In deep woods, New York to Virginia.

Aster lateriflòrus thyrsòideus (A. Gray) Sheldon, Bull. Torr. Club, 20: 286. 1893.

Aster diffusus var. *thyrsoideus* A. Gray, Syn. Fl. 1: Part 2, 187. 1884.

Ashy-pubescent; leaves ovate to lanceolate; branches ascending, rather stiff, mostly short; heads usually densely thyrsoid-paniculate, less markedly secund than in the type. New York and Ontario to Illinois.

Aster lateriflòrus grándis Porter, Mem. Torr. Club, 5: 324. 1894.

Aster bifrons Lindl.; DC. Prodr. 5: 243. 1836. Not All. 1785.
Aster diffusus var. *bifrons* A. Gray, Syn. Fl. 1: Part 2, 187. 1884.

Taller and larger-leaved than the type, the branches spreading; leaves lanceolate, sometimes 6′ long and nearly 1′ wide; heads mostly larger, rather loosely paniculate. In shaded places, southern New York to Kentucky and Illinois.

Aster lateriflòrus pèndulus (Ait.) Burgess.

Aster pendulus Ait. Hort. Kew. 3: 205. 1789.

Leaves linear-elliptic, conspicuously drooping, remotely appressed-serrulate, often with narrowly margined petioles, roughish when dry; branches long, slender, often pendulous; heads long-peduncled; rays and bracts often purple-tinged. In thickets, New York to Virginia.

Aster lateriflòrus horizontàlis (Desf.) Burgess.

Aster horizontalis Desf. Cat. Hort. Paris, Ed. 3, 402. 1829.

Branches long, slender, widely spreading; leaves firm, those of the branches very small, mostly entire; heads very numerous; rays rather large. Southern New York to Virginia.

66. Aster hirsuticaùlis Lindl. Hairy-stemmed Aster. (Fig. 3800.)

Aster hirsuticaulis Lindl.; DC. Prodr. 5: 242. 1836.
Aster lateriflorus hirsuticaulis Porter, Mem. Torr. Club, 5: 324. 1894.

Stem slender, erect, 1½°–3° high, pubescent nearly or quite to the base, the usually short branches spreading or ascending. Leaves thin, glabrous above, usually pubescent on the midvein beneath, serrate with a few appressed teeth, or entire, linear-lanceolate to lanceolate, sometimes 6′ long, 2″–7″ wide, sessile, or the basal ones spatulate and petioled; heads more or less secund on the branches, densely or loosely clustered, often also solitary or few in the lower axils; bracts of the involucre in 3 or 4 series, linear-lanceolate, acuminate or acute; rays white, about 2″ long.

In woods and thickets, New York and Pennsylvania to Kentucky.

67. Aster vimíneus Lam. Small White Aster. (Fig. 3801.)

Aster vimineus Lam. Encycl. 1: 306. 1783.
Aster Tradescanti T. & G. Fl. N. A. 2: 129. 1841. Not L. 1753.

Glabrous or nearly so throughout; stem slender, divergently branched, 2°–5° high. Stem leaves linear-lanceolate, entire, or with a few low teeth, 3′–5′ long, 2″–4″ wide, acuminate at the apex, narrowed to a sessile base, those of the branches much smaller; heads very numerous, small, 3″–5″ broad, 2″–3″ high, generally densely racemose-secund, short-peduncled; involucre broadly turbinate, its bracts linear, acute or acutish, imbricated in about 3 series, green-tipped, appressed; rays numerous, about 2″ long, white; pappus white; achenes minutely pubescent.

In moist soil, Ontario to Florida, west to Minnesota and Arkansas. Aug.–Sept.

Aster vimineus foliolòsus (Ait.) A. Gray, Syn. Fl. 1: Part 2, 186. 1884.
Aster foliolosus Ait. Hort. Kew. 3: 203. 1789.

Branches ascending, very leafy; heads paniculate, scarcely secund, less densely clustered. Massachusetts to Virginia, Illinois and Missouri.

Aster vimineus Columbiànus Britton.

Minutely pubescent, 2°–4° high, the slender branches ascending; leaves linear to linear-lanceolate, those of the stem deflexed; heads about 1′ broad; rays red-purple. Perhaps a distinct species. District of Columbia to New York.

68. Aster multiflòrus Ait. Dense-flowered Aster. White Wreath Aster. (Fig. 3802.)

Aster multiflorus Ait. Hort. Kew. 3: 203. 1789.
Aster multiflorus var. *stricticaulis* T. & G. Fl. N. A. 2. 125. 1841.

Stem strict, much branched and bushy, rough-pubescent or scabrous, 1°–7° high, the branches ascending or spreading. Leaves rigid, linear or linear-oblong, entire, mostly obtuse, sessile or slightly clasping at the base, rough and ciliate, those of the stem ½′–1½′ long, those of the branches very small and crowded; heads 3″–4″ broad, densely crowded, nearly sessile, sometimes slightly secund on the branches; involucre turbinate, 2″–3″ high, its bracts coriaceous, pubescent, in 3 or 4 series, their short green tips obtuse or mucronate, spreading; rays 10–20, white, 1½″–2″ long; pappus brownish white; achenes puberulent.

In dry open places, Maine and Ontario to the Northwest Territory and British Columbia, south to Georgia, Texas and Arizona. Called also Fall-flower. Aug.–Nov.

69. Aster incanopilòsus (Lindl.) Sheldon. White Prairie Aster. (Fig. 3803.)

Aster ramulosus var. *incanopilosus* Lindl. in DC. Prodr. 5: 243. 1836.
Aster multiflorus var. *commutatus* T. & G. Fl. N. A. 2: 125. 1841.
Aster commutatus A. Gray, Syn. Fl. 1: Part 2, 185. 1884.
A. incanopilosus Sheldon, Bull. Torr. Club, 20: 286. 1893.

Similar to the preceding species, except in the inflorescence, the stem rough-pubescent, or sometimes nearly glabrous, 1½°–2½° high, with ascending or divergent branches. Leaves linear or linear-oblong, obtuse, entire, sessile or slightly clasping at the base, those of the stem 1′–3′ long; heads larger than those of *A. multiflorus*, 6″–8″ broad, involucre 3″–4″ high, its bracts squarrose-tipped and sometimes foliaceous; rays 20–30, about 3″ long.

On prairies and along rivers, Northwest Territory to western Nebraska and Texas, west to Oregon, Utah and New Mexico. Aug.–Oct.

70. Aster tenuifòlius L. Perennial Salt-marsh Aster. (Fig. 3804.)

Aster tenuifolius L. Sp. Pl. 873. 1753.
Aster flexuosus Nutt. Gen. 2: 154. 1818.

Perennial, glabrous and fleshy; stem flexuous, striate, at least when dry, sparingly and loosely branched, 1°–2° high. Stem leaves linear, entire, acute, sessile or partly clasping at the base, the lowest lanceolate-linear, 2′–6′ long, 2″–3″ wide, those of the branches minute, bract-like, appressed; heads rather few, 6″–12″ broad, terminating the branches; involucre turbinate, about 4″ high, its bracts lanceolate, acuminate or mucronate, glabrous, green on the back or tip, appressed, imbricated in about 5 series, the outer shorter; rays numerous, longer than the pappus, pale purple or nearly white; pappus tawny; achenes hispid-pubescent, 5-nerved.

In salt marshes, coast of Massachusetts to Florida. Aug.–Oct.

71. Aster exìlis Ell. Slim Aster. (Fig. 3805.)

Aster exilis Ell. Bot. S. C. & Ga. 2: 344. 1824.
Aster divaricatus T. & G. Fl. N. A. 2: 163. 1841. Not L. 1753.

Annual, glabrous, fleshy; stem slender, usually much branched, the branches usually divergent. Leaves linear to linear-lanceolate, 1′–4′ long, 1″–2½″ wide, entire, sessile, acute or acuminate, or the lowest narrowly oblong, 3″–4″ wide and petioled, those of the branches subulate; heads numerous, panicled, about 5″ broad; involucre campanulate, about 3″ high, its bracts linear-subulate, appressed, imbricated in 3 or 4 series; rays purplish, about 2″ long, mostly fewer than the disk-flowers, longer than the pappus; achenes somewhat pubescent.

In moist or wet soil, especially in saline situations, Kansas to Texas, South Carolina and Florida. Aug.–Oct.

72. Aster subulàtus Michx. Annual Salt-marsh Aster. (Fig. 3806.)

Aster subulatus Michx. Fl. Bor. Am. 2: 111. 1803.
Aster linifolius T. & G. Fl. N. A. 2: 162. 1841. Not L. 1753.

Annual, glabrous and fleshy; stem paniculately branched, flexuous above, 1°–6° high, slightly angled, sometimes 1′ in diameter at the base, but usually smaller. Stem-leaves linear-lanceolate, acute, entire, sessile by a broad or slightly clasping base, 2′–10′ long, 1″–8″ wide, those of the branches very small and subulate; heads numerous, 3″–5″ broad; involucre campanulate, or at length hemispheric, 2″–3″ high, its bracts linear-subulate, green, imbricated in 3 or 4 series, the outer shorter; rays 20–30, purplish, scarcely exceeding the nearly white pappus, more numerous than the disk-flowers; achenes compressed, minutely pubescent.

In salt marshes, coast of New Hampshire to Florida. Aug.–Nov.

32. LEUCELÈNE Greene, Pittonia, 3: 147. 1896.

Low perennial herbs, with much branched leafy stems, sessile, rather rigid, narrow entire leaves and small heads of both tubular and radiate white flowers, solitary at the ends of the numerous slender branchlets, involucre turbinate, its bracts well imbricated. Disk-flowers perfect, their corollas white, tubular-funnelform, 5-toothed. Ray-flowers numerous, white, or drying red to rose, pistillate. Style appendages acutish. Achenes elongated, flattened, hispidulous. Pappus a single series of slender rough white bristles. [Greek, referring to the white disk.]

One species, or more, native of the southwestern States and Mexico.

1. Leucelene ericoìdes (Torr.) Greene. Rose Heath Aster. (Fig. 3807.)

Inula (?) *ericoides* Torr. Ann. Lyc. N. Y. 2: 212. 1828.
Aster ericaefolius Rothrock, Bot. Gaz. 2: 70. 1877.
Leucelene ericoides Greene, Pittonia, 3: 148. 1896.

Stems tufted from deep woody roots, corymbosely much branched, 3′–12′ high, hispid or scabrous, the branches erect or diffuse. Leaves hispid-ciliate, erect, or slightly spreading, obtusish or mucronulate, the lower and basal ones spatulate, 3″–6″ long, tapering into short petioles, the upper sessile, linear or linear-spatulate; heads terminating the branches, 5″–8″ broad; involucre broadly turbinate, its bracts lanceolate, appressed, scarious-margined, imbricated in 3 or 4 series; rays 12–15, white to rose, 2″–4″ long.

In dry soil, western Nebraska to Kansas, Texas and Mexico, west to California. May–Aug.

33. BRACHYÁCTIS Ledeb. Fl. Ross. 2: 495. 1846.

Annual, nearly glabrous, somewhat fleshy herbs, with narrow chiefly entire leaves, and small racemose or racemose-paniculate heads of tubular, or also radiate purplish flowers. Involucre campanulate. Central flowers of the head few, perfect, their narrow corollas 4–5-toothed; outer flowers pistillate, usually in 2 series or more, and more numerous than the perfect ones; style-appendages lanceolate; rays very short, or none. Achenes 2–3-nerved, slender, appressed-pubescent. Pappus a single series of nearly white bristles. [Greek. short rays.]

About 5 species, natives of western North America and northern Asia.

1. Brachyactis angústus (Lindl.) Britton. Rayless Aster. (Fig. 3808.)

Tripolium angustum Lindl.; Hook. Fl. Bor. Am. 2, 15. 1834.
Aster angustus T. & G. Fl. N. A. 2: 162. 1841.

Stem usually sparsely pubescent, at least above, racemosely or rarely paniculately branched, 6′–24′ high, striate, at least when dry. Leaves linear, fleshy, ciliate on the margins, acutish, entire, sessile by a rather broad base, the basal (when present) spatulate; heads 4″–6″ broad, racemose on the ascending branches, or terminating them; involucre campanulate or nearly hemispheric, 2″–3″ high, its bracts linear or linear-oblong, somewhat foliaceous, green, acute or obtuse, imbricated in 2 or 3 series, glabrous or slightly ciliate, nearly equal; rays none, or rudimentary; pappus soft and copious.

In wet saline soil, or sometimes in waste places, Minnesota to the Northwest Territory, Utah and Colorado. Found also about Chicago. July–Sept.

34. MACHAERANTHÈRA Nees, Gen. & Sp. Ast. 224. 1832.

Annual, biennial or perennial branched herbs, with leafy stems, alternate, mostly serrate or pinnatifid leaves, the teeth or lobes usually bristle-tipped, and large heads of both tubular and radiate flowers. Involucre of numerous series of imbricated canescent or glandular bracts with herbaceous or foliaceous spreading or appressed tips. Receptacle alveolate, the alveoli usually toothed or lacerate. Ray-flowers numerous, violet to red or purple, pistillate. Disk flowers perfect, their corollas tubular, 5-lobed, yellow, changing to red or brown; anthers exserted, appendaged at the tip, rounded at the base; style-appendages subulate to lanceolate. Achenes turbinate, narrowed below, pubescent. Pappus of numerous stiff rough unequal bristles. [Greek, sickle-anther.]

About 15 species, natives of western North America.

Annual or biennial; leaves pinnatifid. 1. *M. tanacetifolia.*
Perennial or biennial; leaves sharply serrate. 2. *M. sessiliflora.*

1. Machaeranthera tanacetifòlia (H.B.K.) Nees. Tansy Aster. Dagger-flower. (Fig. 3809.)

Aster tanacetifolius H.B.K. Nov. Gen. Sp. 4:95. 1820.
Machaeranthera tanacetifolia Nees, Gen. & Sp. Ast. 225. 1832.

Annual or biennial; stem glandular-pubescent, often viscid, densely leafy, much branched and bushy, 1°–2° high. Leaves sessile, or short-petioled, pubescent, the lowest 1′–3′ long, 2–3-pinnatifid, their lobes linear or oblong, acute or mucronate, the upper pinnatifid, those of the branches sometimes entire; heads numerous, corymbose-paniculate, 1′–2′ broad; involucre hemispheric, 4″–6″ high, its bracts linear, glandular, imbricated in 5–7 series, their green tips very squarrose; rays 15–25, violet-purple, 5″–8″ long, pappus copious, tawny; achenes villous.

In dry soil, Nebraska to Texas and Mexico, west to California. June–Aug.

2. Machaeranthera sessiliflòra (Nutt.) Greene. Viscid Aster. (Fig. 3810.)

Dieteria sessiliflora Nutt. Trans. Am. Phil. Soc. 7, 301. 1840.
Machaeranthera sessiliflora Greene, Pittonia, 3: 60. 1896.

Stem usually stout, finely rough-pubescent or canescent, branched, and viscid-glandular above, 1°–2° high. Leaves lanceolate, linear, or the lowest spatulate, sessile, somewhat viscid, sharply incised-dentate, the larger 1′–3′ long, the teeth bristle-tipped; heads numerous, racemose, or corymbose above, 1′–1½′ broad, the lower often nearly sessile; involucre broadly turbinate or hemispheric, 4″–6″ high, its bracts acute, imbricated in 6–10 series, their tips strongly squarrose; rays numerous, violet, 4″–6″ long; pappus copious; achenes narrow, appressed-pubescent.

In dry soil, central and western Nebraska. Has been referred to *Aster canescens*. July–Oct.

35. ERÍGERON L. Sp. Pl. 863. 1753.

Branching or scapose herbs, with alternate or basal leaves, and corymbose, panicuiate or solitary, peduncled heads, of both tubular and radiate (rarely all tubular) flowers. Involucre hemispheric or campanulate, its bracts narrow, nearly equal, imbricated in but 1 or 2 series in our species. Receptacle nearly flat, usually naked. Ray-flowers, in our species, white, violet or purple, pistillate. Disk-flowers yellow, tubular, perfect, their corollas mostly 5-lobed. Anthers obtuse and entire at the base. Style-branches more or less flattened, their

appendages short, mostly rounded or obtuse. Achenes flattened, usually 2-nerved. Pappus-bristles fragile, slender, scabrous or denticulate, in 1 series, or often an additional outer shorter series. [Greek, early-old, alluding to the early hoary pappus.]

A genus of some 130 species, of wide geographic distribution, most abundant in the New World. In addition to the following, about 60 others occur in the southern and western parts of North America.

* Rays long, narrow, usually equalling or longer than the diameter of the disk.

† Stem 1′–10′ high, simple, leafy; head solitary; involucre woolly. 1. *E. uniflorus.*

† † Stem 4′–3° high, leafy, usually branched; involucre hirsute or glabrous.

1. Roots perennial, thick and woody.

Heads 1′–2′ broad; leaves lanceolate, ovate, oblong, or spatulate.

Rays violet or purple; stem-leaves ovate, lanceolate, or oblong.

Stem-leaves linear-lanceolate, the upper much smaller. 2. *E. asper.*

Stem-leaves ovate-lanceolate, the upper little smaller. 3. *E. subtrinervis.*

Rays mostly white; stem-leaves linear or linear-oblong. 4. *E. caespitosus.*

Heads ½′–1′ broad; leaves linear.

Plants hirsute or canescent; pappus double; western species.

Stem hirsute; achenes pubescent; flowers white. 5. *E. pumilis.*

Stem appressed-canescent; achenes glabrous; flowers purple or white. 6. *E. canus.*

Plant nearly glabrous; pappus simple; northern. 7. *E. hyssopifolius.*

2. Perennial by decumbent rooting stems or stolons. 8. *E. flagellaris.*

3. Roots annual or biennial, fibrous; plants often perennial by offsets.

Heads 1′–1½′ broad, few; stem simple; eastern. 9. *E. pulchellus.*

Heads ½′–1′ broad, numerous; stem branched.

Rays 100–150, narrow, mostly purple or violet.

Pappus simple; plant erect, corymbosely branched. 10. *E. Philadelphicus.*

Pappus double; plant diffusely branched, western. 11. *E. divergens.*

Rays much less numerous, purplish or white.

Plants 6′–12′ high, diffuse, western; pappus simple. 12. *E. Bellidiastrum.*

Plants 1°–3° high, erect, corymbosely branched; pappus double.

Stem-leaves lanceolate, nearly all sharply serrate. 13. *E. annuus.*

Stem-leaves linear-lanceolate or oblong, nearly all entire. 14. *E. ramosus.*

† † † Stem leafless or nearly so; heads ½′ broad, corymbose. 15. *E. vernus.*

* * Rays inconspicuous or short; a row of tubular pistillate flowers inside the row of rays. 16. *E. acris.*

1. Erigeron uniflòrus L. Arctic Erigeron. (Fig. 3811.)

Erigeron uniflorus L. Sp. Pl. 864. 1753.

Perennial by short branching rootstocks; stems slender, single or tufted, more or less pubescent, simple, erect, 1′–10′ high. Basal leaves petioled, spatulate, obtuse, entire, 1′–2′ long; stem-leaves sessile, lanceolate or linear-lanceolate, entire, acute or obtuse; head solitary, peduncled, ½′–1′ broad; rays about 100, purple or purplish, 2″–4″ long; involucre hemispheric, its bracts linear-lanceolate, acute, copiously woolly; pappus simple.

Labrador and Arctic America to Alaska, south in the Rocky Mountains to Colorado and in the Sierra Nevada. Also in Europe. Summer.

1/2

3/4

2. Erigeron ásper Nutt. Rough Erigeron. (Fig. 3812.)

Erigeron asper Nutt. Gen. 2: 147. 1818.
Erigeron glabellus Nutt. loc. cit. 1818.?

Perennial by a woody root; stem simple, or branched above, more or less pubescent, sometimes hirsute, 6′–24′ high. Leaves glabrous, pubescent or ciliate, entire, the basal ones spatulate, obtuse, 2′–4′ long, 3″–1′ wide, narrowed into margined petioles; stem leaves oblong-lanceolate or linear-lanceolate, obtuse or acute, the upper smaller; heads several or solitary, slender-peduncled, 1′–2′ broad; involucre hemispheric, its bracts linear, acute, hirsute or pubescent; rays 100–150, very narrow, violet, purple, or nearly white, 4″–7″ long; pappus double, the outer row of bristles much shorter than the inner.

In dry soil, Minnesota to Nebraska, west to the Northwest Territory, Utah and New Mexico. June-Sept.

4. Erigeron caespitòsus Nutt. Tufted Erigeron. (Fig. 3814.)

Diplopappus canescens Hook. Fl. Bor. Am. 2: 21. 1834. Not *E. canescens* Willd. 1804.
Erigeron caespitosus Nutt. Trans. Am. Phil. Soc. (II) 7: 307. 1841.

Perennial by a deep root; stems tufted, canescent, simple, or branched above, 6′–12′ high. Leaves canescent or pubescent, entire, the lower and basal ones petioled, narrowly oblanceolate or spatulate, obtuse or acutish, 1′–3′ long; stem leaves linear or linear-oblong, acute or obtuse, sessile, the upper gradually shorter, heads solitary or several, short-peduncled, 1′–1½′ broad; involucre hemispheric, its bracts lanceolate or linear-oblong, acute, canescent; rays 40–60, 3″–6″ long, white or pinkish; pappus double, the outer series of bristles very short.

In dry soil, Manitoba and the Northwest Territory to Nebraska (according to Webber), New Mexico and California. June–Aug.

3. Erigeron subtrinérvis Rydberg. Three-nerved Fleabane. (Fig. 3813.)

Erigeron glabellus var. *mollis* A. Gray, Proc. Acad. Phila. 1863: 64. 1864. Not *E. mollis* D. Don, 1802.
Erigeron subtrinervis Rydberg, Mem. Torr. Club, 5: 328. 1894.

Similar to the preceding species, perennial by a woody root, finely pubescent all over. Stems leafy to the inflorescence; leaves entire, thin, the basal and lower ones oblanceolate to oblong, obtuse or acute, petioled, the upper lanceolate or ovate-lanceolate, sessile or somewhat clasping, acute, rather distinctly 3-nerved; heads 1′–1½′ broad, corymbose, or rarely solitary; involucre hemispheric, hirsute; rays numerous, blue to pink; pappus double, the outer bristles very short.

South Dakota to Nebraska and Utah.

5. Erigeron pùmilus Nutt. Low Erigeron. (Fig. 3815.)

Erigeron pumilus Nutt. Gen. 2: 147. 1818.

Perennial by a deep root; stems tufted, hirsute, slender, simple, or branched, 4′–10′ high. Leaves entire, hirsute, the lower and basal ones narrowly spatulate or linear, petioled, obtuse or acutish, 1′–4′ long, 1″–2″ wide; stem leaves linear, sessile, ½′–2½′ long, acute; heads solitary or several, 6″–10″ broad, short-peduncled; involucre hemispheric, its bracts linear, acute, hirsute; rays 50–80, white, 3″–4″ long, at length deflexed; pappus double, the outer row of bristles short and more or less intermixed with the inner; achenes pubescent.

Dry plains, Northwest Territory to western Nebraska, west to British Columbia, Colorado and Utah. May–Sept.

6. Erigeron cànus A. Gray. Hoary Erigeron. (Fig. 3816.)

Erigeron canus A. Gray, Mem. Am. Acad. (II) 4: 67. 1849.

Perennial by a deep woody root, resembling the preceding species; stems slender, erect, tufted, appressed-canescent, 6′–10′ high, simple, or branched above. Leaves narrow, entire, canescent, the basal and lower ones narrowly spatulate, petioled, 2′–4′ long, the upper linear, sessile, acute, gradually smaller; heads solitary, or 2-4, peduncled, 6″–8″ broad; involucre hemispheric, its bracts linear, acute, densely canescent; rays 40–50, purple or white, 2″–3″ long; achenes glabrous, 8–10-nerved; pappus double, the outer row of bristles rather conspicuous.

In dry soil, western Nebraska and Wyoming to Colorado and New Mexico. June–Aug.

7. Erigeron hyssopifòlius Michx. Hyssop-leaved Erigeron. (Fig. 3817.)

Erigeron hyssopifolius Michx. Fl. Bor. Am. 2: 123. 1803.

Aster graminifolius Pursh, Fl. Am. Sept. 545. 1814.

Perennial by slender rootstocks; stems tufted or single, very slender, simple or branched, glabrous or very nearly so, 4′–15′ high. Leave narrow, thin, the basal and lower ones oblong or spatulate, short-petioled, 1′–1½′ long, 1½″–2″ wide, the upper linear or linear-oblong, acute, usually numerous; heads solitary or several, slender-peduncled, 5″–8″ broad; peduncles appressed pubescent, involucre hemispheric, its bracts linear-lanceolate, sparingly pubescent; rays 20–30, white or purplish, 2″–3″ long; pappus simple.

On moist cliffs, Newfoundland to northern Vermont, west to the Northwest Territory and Lake Superior. July–Aug.

8. Erigeron flagellàris A. Gray. Running Fleabane. (Fig. 3818.)

Erigeron flagellaris A. Gray, Mem. Am. Acad. (II) 4: 68. 1849.

Appressed-pubescent, sometimes densely so, perennial by decumbent rooting stems or stolons; root slender. Stem slender, branched, the branches elongated; leaves entire, the basal and lower ones spatulate or oblong, obtuse or acute, 1′–2′ long, narrowed into long petioles, the upper sessile, linear or linear-spatulate, much smaller; peduncles solitary, elongated; heads about 1′ broad and ¼′ high; involucre hemispheric, its narrow bracts pubescent; rays very numerous, white to pink; pappus double, the outer series of subulate bristles.

In moist soil, South Dakota to Colorado, Utah, western Texas and New Mexico. May–July.

9. Erigeron pulchéllus Michx. Robin's or Poor Robin's Plantain. (Fig. 3819.)

E. pulchellus Michx. Fl. Bor. Am. 2: 124. 1803.
Erigeron bellidifolius Muhl.; Willd. Sp. Pl. 3: 1958. 1804.

Perennial by stolons and offsets, villous-pubescent; stems simple, slender, 10′–24′ high. Basal leaves tufted, spatulate or obovate, somewhat cuneate at the base, narrowed into short margined petioles, obtuse at the apex, 1′–3′ long, ½′–2′ wide, dentate or serrate; stem-leaves sessile, partly clasping, oblong, lanceolate to ovate, mostly acute, entire, or sparingly serrate; heads 1–6, slender-peduncled, 1′–1½′ broad; involucre depressed-hemispheric, its bracts linear, acuminate, villous; rays numerous, violet or purplish, 4″–7″ long; achenes nearly glabrous; pappus simple.

On hills and banks, Nova Scotia to Ontario and Minnesota, south to Florida and Louisiana. Called also Rose Petty, Robert's Plantain and Blue Spring Daisy. April–June.

10. Erigeron Philadélphicus L. Philadelphia Fleabane. Skevish. (Fig. 3820.)

Erigeron Philadelphicus L. Sp. Pl. 863. 1753.

Perennial by stolons and offsets, soft-pubescent or sometimes nearly glabrous; stems slender, mostly branched above, 1°–3° high. Basal and lower leaves spatulate or obovate, obtuse, dentate, 1′–3′ long, narrowed into short petioles; upper stem-leaves clasping and often cordate at the base, obtuse or acute, dentate or entire; heads several or numerous, corymbose-paniculate, 5″–12″ broad, slender-peduncled; peduncles thickened at the summit; involucre depressed-hemispheric, its bracts linear, usually scarious-margined; rays 100–150, 2″–4″ long, light rose-purple; pappus simple; achenes puberulent.

In fields and woods, throughout North America except the extreme north, but locally rare. Buds drooping. Called also Sweet Scabious and Daisy Fleabane. April–Aug.

11. Erigeron divérgens T. & G. Spreading Fleabane. (Fig. 3821.)

Erigeron divergens T. & G. Fl. N. A. 2: 175. 1841.

Annual or biennial, diffusely branched, 6′–15′ high, densely cinereous-pubescent or hirsute. Basal and lower leaves spatulate or oblanceolate, acute or obtuse, mostly petioled, entire, dentate or lobed, 1′–2′ long, 2″–5″ wide, the upper sessile, linear or narrowly spatulate, usually acute, gradually smaller; heads slender-peduncled, 8″–12″ broad, usually numerous; involucre hemispheric, about 2″ high, its bracts linear, acute, hirsute or canescent; rays about 100, purplish, violet or nearly white, 2″–4″ long; pappus double, the short outer row of bristles subulate.

In moist soil, Montana to Nebraska, Texas and Mexico, west to Washington and California. April–Sept.

12. Erigeron Bellidiástrum Nutt.
Western Daisy Fleabane. (Fig. 3822.)

Erigeron Bellidiastrum Nutt. Trans. Am. Phil. Soc. (II) 7: 307. 1841.

Annual, much branched, 6′–15′ high, cinereous-pubescent throughout. Leaves entire, linear-spatulate, the lower and basal petioled, 1′–1½′ long, the upper sessile and smaller; heads several, or numerous, 5″–8″ broad; involucre hemispheric, about 2″ high, its bracts linear, hirsute, acute; rays 30–65, purplish, about 2″ long; pappus a single series of capillary bristles.

In moist soil, Nebraska and Kansas to Texas. May–July.

13. Erigeron ánnuus (L.) Pers.
Sweet Scabious. (Fig. 3823.)

Aster annuus L. Sp. Pl. 875. 1753.
Erigeron annuus Pers. Syn. 2: 431. 1807.

Annual, sparingly pubescent with spreading hairs; stem erect, corymbosely branched, 1°–4° high. Leaves thin, the lower and basal ones ovate or ovate-laneeolate, mostly obtuse, petioled, usually coarsely dentate, 2′–6′ long, 1′–3′ wide, the upper sessile or short-petioled, lanceolate, oblong, or linear-laneeolate, acute or aeuminate, mostly sharply dentate in the middle, those of the branches narrower and often entire; heads rather numerous, 5″–7″ broad, mostly short-peduncled; braets of the hemispheric involucre somewhat hispid; rays 40–70, linear, white, or commonly tinged with purple, 2″–4″ long; pappus double, the inner a series of slender fragile deciduous bristles, often wanting in the ray-flowers, the outer a persistent series of short, partly united, slender scales.

In fields, Nova Scotia to the Northwest Territory, south to Virginia, Kentueky and Missouri. Naturalized in eontinental Europe. Also ealled Daisy Fleabane. May–Nov.

14. Erigeron ramòsus (Walt.) B.S.P.
Daisy Fleabane. (Fig. 3824.)

Doronicum ramosum Walt. Fl. Car. 205. 1788.
E. strigosus Muhl.; Willd. Sp. Pl. 3: 1956. 1804.
Erigeron ramosus B.S.P. Prel. Cat. N. Y. 27. 1888.

Resembles the preeeding species, but is usually lower and the pubescence more appressed. Stem-leaves linear-oblong or linear-lanceolate, nearly all of them entire; basal and lowest spatulate or oblong, usually serrate; bracts of the involucre glabrous or nearly so; pappus similar to that of the preeeding; rays white, or sometimes purplish, oceasionally minute or wanting.

In fields, Nova Scotia to the Northwest Territory, south to Florida, Louisiana and Texas. May–Nov.

Erigeron ramòsus Beyrichii (F. & M.) Smith & Pound, Bot. Surv. Neb. 2: 11. 1893.
Stenactis Beyrichii F. & M. Index Sem. Hort. Petrop. 5: 1838.

Stem more slender; leaves narrower; heads smaller; pubescence minute. Georgia to Nebraska and Texas.

15. Erigeron vérnus (L.) T. & G. Early Fleabane. (Fig. 3825.)

Aster vernus L. Sp. Pl. 876. 1753.

Erigeron nudicaulis Michx. Fl. Bor. Am. 2: 124. 1803.

Erigeron vernus T. & G. Fl. N. A. 2: 176. 1841.

Perennial by stolons and offsets; stem slender, simple or branched above, glabrous, or the branches pubescent, 1°–2½° high. Leaves mainly in a basal rosette, glabrous, obovate, oval or spatulate, obtuse, repand-denticulate or entire, 2′–4′ long, narrowed into margined petioles; stem-leaves mostly reduced to subulate-lanceolate scales, the lowest sometimes spatulate or oblong; heads not numerous, corymbose, peduncled, about 5″ broad; involucre hemispheric, its bracts linear-subulate; rays 20–30, white or pink, 2″–3″ long; pappus simple; achenes usually 4-nerved.

In marshes and moist soil, Virginia to Florida and Louisiana. April–May.

16. Erigeron àcris L. Blue or Bitter Fleabane. (Fig. 3826.)

Erigeron acris L. Sp. Pl. 863. 1753.

Biennial or perennial; stem hirsute-pubescent, slender, simple, or branched above, 6′–18′ high. Leaves pubescent or glabrous, entire, the basal and lower ones spatulate, mostly obtuse, 1′–3′ long, petioled, those of the stem mostly oblong or oblanceolate, obtuse or acutish, sessile, shorter; heads several or numerous, racemose or paniculate, peduncled, 5″–6″ broad; involucre hemispheric, its bracts linear, hirsute; rays numerous, purple, equalling or slightly exceeding the brownish pappus; tubular pistillate flowers filiform, numerous; pappus simple or nearly so, copious.

Labrador to British Columbia, south in the Rocky Mountains to Colorado and Utah. Also in Europe and Asia. July–Aug.

Erigeron àcris Droebachiànus (O. F. Mueller) Blytt, Norg. Fl. 1: 562. 1861.

Erigeron Droebachianus O. F. Mueller, Fl. Dan. *pl. 874.* 1782.

Usually taller and less pubescent, or glabrate; involucre nearly glabrous. New Brunswick to western Ontario, Alaska, British Columbia and Colorado. Also in Europe.

Erigeron àcris débilis A. Gray, Syn. Fl. 1: Part 2, 220. 1884.

Slightly pilose-pubescent, very slender, heads few. Range of the last.

36. LÉPTILON Raf. Am. Month. Mag. 2: 268. 1818.

[Caenotus Raf. Fl. Tell. 2: 50. 1836.]

Annual or biennial herbs, with small racemose thyrsoid or panicled heads of white flowers, the rays small, usually shorter than the diameter of the disk, or none. Involucre mostly campanulate, its narrow bracts in 2 or 3 series. Receptacle naked. Ray-flowers pistillate; disk-flowers perfect, their corollas usually 4-lobed or 4-toothed, the anthers obtuse at the base; style-branches somewhat flattened, their appendages short. Achenes flattened. Pappus of numerous simple fragile bristles in 1 series. [Greek, referring to the small heads.]

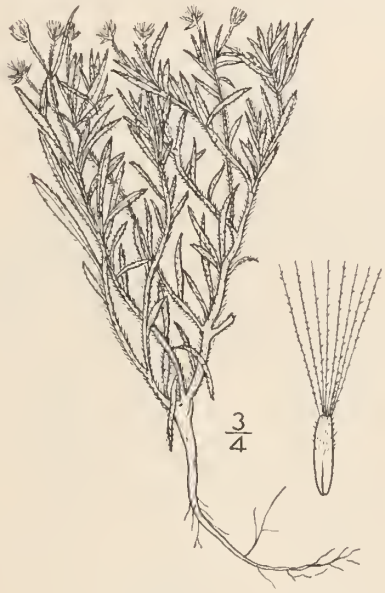
About 20 species, natives of America and Asia. Besides the following, 2 or 3 others occur in the southwestern United States and one is naturalized from Asia on the southern Atlantic and Pacific coasts.

1. Leptilon Canadénse (L.) Britton. Horse-weed. Canada Fleabane. (Fig. 3827.)

Erigeron Canadensis L. Sp. Pl. 863. 1753.

Stem hispid-pubescent, or glabrate, 3′–10° high, the larger plants pauiculately much branched. Leaves usually pubescent or ciliate, the basal aud lower spatulate, petioled, incised, dentate or entire, 1′–4′ long, obtuse or acutish, those of the stem linear and mainly entire; heads usually very numerous; about 2″ broad; involucre campanulate, 1″–1½″ high, its bracts linear, acute, glabrate, the outer shorter; rays numerous, white, shorter thau the pappus and mostly shorter than their tubes.

In fields and waste places, a common weed throughout North America except the extreme north. Widely distributed as a weed in the Old World and in South America. Called also Butter-weed, Prideweed, Fireweed, Blood-staunch, Cow's- or Colt's-tail, Bitter-weed. June–Nov.



2. Leptilon divaricàtum (Michx.) Raf. Low Horse-weed. Purple Horse-weed. (Fig. 3828.)

Erigeron divaricatus Michx. Fl. Bor. Am. 2: 123. 1803.
Leptilon divaricatum Raf. Fl. Tell. 2: 265. 1818.

Stem diffusely much branched, 3′–12′ high, pubescent or hirsute. Leaves all linear or subulate, entire, 4″–12″ long, about ½″ wide, the uppermost minute; heads numerous, about 2″ broad; involucre campanulate, 1″ high, its bracts liuear, acute, pubescent, the outer shorter; rays purplish, shorter than their tubes.

In sandy soil, especially along rivers, Indiana to Minnesota, south to Tennessee, Louisiana, Nebraska and Texas. June–Oct.

37. DOELLINGÈRIA Nees, Gen. & Sp. Ast. 176. 1832.

Perennial leafy herbs, the lower leaves reduced to scales or sheaths, the upper large, mostly entire, acute or acuminate in our species. Basal leaves none. Heads corymbose, usually numerous; iuvolucre campanulate to hemispheric, its bracts imbricated in several series, appressed, thin, sometimes scarious-margined, their tips not herbaceous nor foliaceous. Receptacle foveolate. Ray-flowers white, pistillate, not very numerous. Disk-flowers perfect, the corolla with a slender tube abruptly expanded into a campanulate 5-lobed limb, white to greenish in our species. Anthers obtuse at the base; style-appendages ovate to subulate (rarely obtuse). Achenes obovoid, glabrous, or pubescent. Pappus double, the outer series of numerous short bristles or scales, the inner series of long capillary bristles, some or all of which have thickeued tips. [In honor of Th. Dollinger, botanical explorer.]

About 4 species, natives of eastern North America.

Leaves lanceolate to ovate; heads mostly numerous.
  Leaves lanceolate to oblong-lanceolate, acuminate. 1. *D. umbellata.*
  Leaves ovate to ovate-lanceolate, acute. 2. *D. humilis.*
Leaves, at least the lower, obovate; heads commonly few. 3. *D. infirma.*

1. Doellingeria umbellàta (Mill.) Nees. Tall Flat-top White Aster. (Fig. 3829.)

Aster umbellatus Mill. Gard. Dict. Ed. 8, No. 22. 1768.
Diplopappus umbellatus Hook. Fl. Bor. Am. 2: 22. 1834.
D. umbellata Nees, Gen. & Sp. Ast. 178. 1832.

Stem glabrous or pubescent above, striate, corymbosely branched at the summit, 2°–8° high. Leaves lanceolate, to oblong-lanceolate, ascending, glabrous above, usually pubescent on the veins beneath, membranous, acuminate at the apex, narrowed at the base into short petioles, or the uppermost sessile, hispid-margined, those of the stem 5′–6′ long, ½′–1′ wide; heads numerous, 6″–10″ broad, in terminal compound corymbs; involucre broadly campanulate or hemispheric, 1½″–2″ high, its bracts lanceolate, usually pubescent or ciliate, acutish or obtuse, imbricated in 3 or 4 series, the outer shorter; rays 10–15, white; style-appendages ovate, acute; pappus nearly white; achenes nerved, slightly pubescent.

In moist soil, Newfoundland to Georgia, west to the Northwest Territory, Michigan and Arkansas. July–Oct.

Doellingeria umbellàta pùbens (A. Gray) Britton.

Aster umbellatus var. *pubens* A. Gray, Syn. Fl. 1: Part 2, 197. 1884.

Under leaf-surfaces pubescent. Michigan to the Northwest Territory.

2. Doellingeria hùmilis (Willd.) Britton. Broad-leaved Flat-top White Aster. (Fig. 3830.)

Aster humilis Willd. Sp. Pl. 3: 2038. 1804.
D. amygdalina Nees, Gen. & Sp. Ast. 179. 1832.
Aster umbellatus var. *latifolius* A. Gray, Syn. Fl. 1: Part 2, 197. 1884.

Similar to the preceding species, usually lower, seldom over 4° high. Stem striate, corymbosely branched above, glabrous, or somewhat pubescent. Leaves ovate to ovate-lanceolate, rather firm, sessile, or the lower very short-petioled, acute or short-acuminate at the apex, narrowed, or sometimes rounded at the base, rough-margined, those of the stem 1′–3′ long, ½′–2′ wide, inflorescence as in *D. umbellata*; pappus dirty white; achenes somewhat pubescent.

In moist soil, southern New Jersey and Pennsylvania to Florida and Texas. July–Sept.

3. Doellingeria infirma (Michx.) Greene. Cornel-leaved Aster. (Fig. 3831.)

Aster infirmus Michx. Fl. Bor. Am. 2: 109. 1803.
Diplopappus cornifolius Less.; Darl. Fl. Cestr. 474. 1837.
D. infirma Greene, Pittonia, 3: 52. 1896.

Stem slender, glabrous, or roughish above, sparingly branched at the summit, terete, 1½°–3° high. Leaves entire, hispid-margined, glabrous above, sparingly hispid on the veins beneath, the lower obovate, small, obtuse, usually sessile, the upper larger, oblong-lanceolate, acute, 2′–5′ long, 1′–1½′ wide; heads few, about 1′ broad, in a divergently branched terminal corymbose cluster; involucre broadly campanulate, 2″–3″ high, its bracts oblong-lanceolate, obtuse, sparingly pubescent, imbricated in about 4 series, the outer much shorter; rays 8–15, white; style-appendages subulate; pappus tawny; achenes nerved, glabrous.

In dry, usually rocky soil, Massachusetts to New York, Pennsylvania and Tennessee. Aug.–Sept.

38. IONÁCTIS Greene, Pittonia, 3: 245. 1897.

Low, mostly branching, perennial herbs with numerous narrow entire 1-nerved leaves, and rather large and showy heads of tubular and radiate flowers terminating the stem and branches. Basal leaves none. Involucral bracts coriaceous, imbricated in several series, appressed, their tips not herbaceous. Ray-flowers normally violet, pistillate. Disk-flowers perfect, the corolla with a campanulate limb. Achenes villous. Pappus double, the inner series of long capillary bristles, the outer much shorter. [Greek, violet rays.]

Three known species, natives of North America.

1. Ionactis linariifòlius (L.) Greene. Stiff or Savory-leaved Aster. (Fig. 3832.).

Aster linariifolius L. Sp. Pl. 874. 1753.
Diplopappus linariifolius Hook. Fl. Bor. Am. 2: 21. 1834.
Ionactis linariifolius Greene, Pittonia, 3: 245. 1897.

Stems tufted, stiff, puberulent or scabrous, very leafy, corymbosely branched above, 6′–2° high. Leaves linear or spatulate, spreading, 1-nerved, rigid, entire, rough, usually ciliolate on the margins, mucronulate, 9″–18″ long, 1″–2″ wide, sessile, those of the branches much smaller and somewhat appressed; heads several, terminating the branchlets, about 1′ broad; involucre broadly turbinate, its bracts linear-lanceolate, keeled, green on the back, appressed, imbricated in 4 or 5 series, the inner obtuse, the outer usually acute; rays 10–15, violet, rarely white, 4″–5″ long, entire, or their tips dentate, or even laciniate; pappus bristles in 2 series, tawny, the outer ones setose; achenes silky.

In dry or rocky soil, Newfoundland to Quebec and Florida, west to Minnesota, Missouri and Texas. Called also Sandpaper- or Pine-Starwort. July-Oct.

39. BÁCCHARIS L. Sp. Pl. 860. 1753.

Dioecious shrubs, with alternate leaves, and small paniculate or corymbose heads of tubular flowers. Involucre campanulate in our species, its bracts imbricated in several series, the outer shorter. Receptacle flat, naked, commonly foveolate. Corolla of the pistillate flowers slender, that of the staminate tubular, 5-lobed. Anthers obtuse and entire at the base. Style-branches narrow or subulate, those of the fertile flowers smooth, exserted, those of the sterile flowers rudimentary, tipped with an ovate pubescent appendage. Achenes more or less compressed, ribbed. Pappus of the fertile flowers copious, capillary, that of the sterile flowers short. [Named for Bacchus; originally applied to some different shrubs.]

About 275 species, all American, most abundant in South America. Besides the following, some 18 others occur in the southern and western United States.

Shrubs; pappus of fertile flowers in 1 or 2 series.
- Leaves oblong, or lance-oblong, mostly obtuse, sparingly dentate. 1. *B. salicina.*
- Leaves deltoid-obovate, or oblong, the lower coarsely dentate. 2. *B. halimifolia.*
- Leaves linear or linear-lanceolate, mostly acute, sparingly dentate. 3. *B. neglecta.*

Herbaceous, from a woody base; pappus of fertile flowers in several series. 4. *B. Wrightii.*

1. Baccharis salícina T. & G. Willow Baccharis. (Fig. 3833.)

Baccharis salicina T. & G. Fl. N. A. 2: 258. 1841.

A glabrous glutinous much-branched shrub, 3°–6° high, the branches ascending. Leaves firm, oblong-lanceolate or somewhat oblanceolate, more or less conspicuously 3-nerved, mostly obtuse at the apex, narrowed into a cuneate subsessile base, 1′–1½′ long, 2″–6″ wide, sparingly repand-dentate, or entire; heads in peduncled clusters of 1–7, the involucre of both sterile and fertile ones campanulate, 2½″–3″ high, its bracts ovate or ovate-lanceolate, acute or subacute; pappus usually but a single series of nearly white capillary bristles.

Western Kansas and eastern Colorado to Texas. May-July.

2. Baccharis halimifòlia L. Groundsel-tree or -bush. Pencil-tree. (Fig. 3834.)

Baccharis halimifolia L. Sp. Pl. 860. 1753.

A branching glabrous shrub, 3°–10° high, the branchlets angled, sometimes minutely scurfy. Leaves thick, those of the stem and larger branches obovate or deltoid-obovate, obtuse, petioled, coarsely angular-dentate, 1′–3′ long, ½′–2′ wide, those of the branchlets oblanceolate, short-petioled or sessile, entire, or few-toothed toward the apex; heads in peduncled clusters of 1–5, those of the sterile plant nearly globose when young, the bracts of the involucre oblong-ovate, obtuse, glutinous, appressed, the inner ones of the pistillate heads lanceolate, acute or acutish; fertile pappus bright white, 3″–4″ long, of 1–2 series of capillary bristles, much exceeding the involucre.

Along salt marshes and tidal rivers, extending beyond saline influence, Massachusetts to Florida and Texas. The white pappus is very conspicuous in autumn. Sept.–Nov.

Baccharis glomerulifòlia Pers., which has larger heads glomerate in the axils of the upper leaves, is doubtfully reported from southern Virginia, but occurs along the coast from North Carolina to Florida.

3. Baccharis neglécta Britton. Linear-leaved Baccharis. (Fig. 3835.)

A much-branched, glabrous or slightly glutinous shrub, 3° high or more, the branches paniculate, slender, ascending. Leaves narrowly linear to linear-lanceolate, faintly 3-nerved, acute, or the lower subobtuse at the apex, gradually attenuate into a nearly sessile base, 1′–3′ long, 1″–3″ wide, entire, or remotely dentate or denticulate, green in drying; heads in short-peduncled clusters; involucre of both kinds of heads campanulate, 2″ high, its outer bracts ovate, acute or somewhat obtuse, the inner lanceolate, acuminate; pappus of the fertile flowers a single series of capillary dull-white bristles.

Nebraska to Texas and North Mexico. Has been referred to *B. angustifolia* Michx. July–Sept.

4. Baccharis Wrightii A. Gray. Wright's Baccharis. (Fig. 3836.)

Baccharis Wrightii A. Gray, Pl. Wright. 1: 101. 1852.

Herbaceous from a thick woody base, much branched, glabrous, not glutinous, 1°–3° high, the branches straight, nearly erect, slender, striate. Leaves linear, sessile, 1-nerved, entire, 3″–12″ long, ½″–1″ wide; heads solitary at the ends of the branches, 5″–6″ broad; involucre of the sterile heads hemispheric, about 3″ high, that of the fertile ones somewhat campanulate and longer; bracts of both involucres lanceolate, acuminate, with scarious margins and a green back; pappus of the fertile flowers of several series of tawny or purplish capillary bristles.

Western Kansas and Colorado to Texas, Arizona and Chihuahua. April–July.

40. FILÀGO L. Sp. Pl. 927. 1753.

[EVAX Gaertn. Fr. & Sem. 2: 393. *pl. 165. f. 3.* 1791.]

White-woolly annual herbs, with alternate entire leaves, and small discoid clustered heads, usually subtended by leafy bracts. Bracts of the involucre few and scarious. Receptacle convex or elougated, chaffy, each chaffy scale subtending an achene. Outer flowers of the heads in several series, pistillate, fertile, their corollas filiform, minutely 2-4-dentate. Ceutral flowers few, perfect, mainly sterile, their corollas tubular, 4-5-toothed. Anthers sagittate at the base, the auricles acuminate. Achenes compressed or terete. Pappus none. [Latin *filum*, a thread.]

About 12 species, natives of temperate or warm regions of both the New World and the Old. In addition to the following, 3 others occur in the western and southwestern United States.

1. Filago prolifera (Nutt.) Britton. Filago. (Fig. 3837.

Evax prolifera Nutt.; DC. Prodr. 5: 459. 1836.
Diaperia prolifera Nutt. Trans. Am. Phil. Soc. (II) 7: 338. 1841.
Filago prolifera Britton, Mem. Torr. Club, 5: 329. 1894.

Stem simple, or branched at the base, very leafy, 2′–6′ high. Leaves spatulate, obtuse, sessile, ascending or appressed, 4″–8″ long, 1″–2½″ wide; heads in a sessile leafy-bracted cluster, usually subtended by 1 or several slender, nearly leafless branches, each terminated by a similar cluster, or these again proliferous; heads oblong or fusiform; receptacle convex; chaff of the central sterile flowers woolly-tipped, that of the fertile flowers scarious, mostly glabrous.

In dry soil, Texas to western Kansas and South Dakota, west to Colorado and New Mexico. April–July.

41. GÍFOLA Cass. Bull. Philom. 1819: 143. 1819.

[FILAGO L. Gen. Pl. Ed. 5. 1758. Not Sp. Pl. 1753.]

White-woolly herbs, closely resembling those of the preceding genus, with alternate entire leaves, and small discoid glomerate heads, often subtended by leafy bracts, the clusters proliferous in our species. Involucre small, its bracts scarious, imbricated in several series, the outer usually tomentose. Receptacle subulate, cylindric or obconic, chaffy, each chaffy scale near its base enclosing an achene. Outermost flowers pistillate, fertile, with filiform corollas and no pappus, or the pappus a few rudimentary bristles; inner flowers also pistillate and fertile, but with a pappus of capillary scabrous bristles; central (uppermost) flowers few, perfect, their corollas tubular, their pappus capillary and scabrous. Anthers sagittate at the base. Achenes terete or slightly compressed. [Anagram of *Filago*.]

About 10 species, natives of warm and temperate regions. In addition to the following, 3 Californian species are probably to be referred to this genus.

1. Gifola Germánica (L.) Dumort. Cudweed. Cotton Rose. Herba Impia. (Fig. 3838.)

Gnaphalium Germanicum L. Sp. Pl. 857. 1753.
Filago Germanica L. Sp. Pl. Ed. 2, 1311. 1763.
Gifola Germanica Dumort. Fl. Belg. 68. 1827.

Annual, erect, cottony, 4′–18′ high, simple, or branched at the base, very leafy. Leaves sessile, lanceolate, linear, or slightly spatulate, erect or ascending, obtuse or acutish, 3″–12″ long; stem terminated by a sessile dense cluster of heads, usually subtended by several leafy branches terminated by similar clusters and these often again proliferous; heads 12–30 in each cluster, many-flowered; involucre ovoid, light yellow, its bracts mainly acute.

In dry fields, southern New York to Pennsylvania and North Carolina. Old names Downweed, Hoarwort, Owl's Crown, Chafeweed, Childing Cudweed. May–Sept.

42. PLÙCHEA Cass. Bull. Philom. 1817: 31. 1817.

Pubescent or glabrous herbs, or some tropical species shrubby, with alternate dentate leaves, and small heads of tubular flowers in terminal corymbose cymes. Involucre ovoid, campanulate, or nearly hemispheric, its bracts appressed, herbaceous, imbricated in several series. Receptacle flat, naked. Outer flowers of the head pistillate, their corollas filiform, 3-cleft or dentate at the apex. Central flowers perfect, but mainly sterile, their corollas 5-cleft. Anthers sagittate at the base, the auricles caudate. Style of the perfect flowers 2-cleft or undivided. Achenes 4–5-angled. Pappus a single series of capillary scabrous bristles. [Named for the Abbé N. A. Pluche, of Paris.]

About 30 species, widely distributed in warm and temperate regions. In addition to the following, another indigenous species occurs in the southwestern United States, and two introduced ones have been found in waste places in Florida.

Perennial; leaves sessile, cordate, or clasping at the base. 1. *P. viscosa.*
Annual; leaves, at least those of the stem, petioled.
Leaves short-petioled; heads about 3″ high; involucral bracts densely puberulent. 2. *P. camphorata.*
Leaves slender-petioled; heads 2″–2½″ high; involucral bracts granulose, ciliate. 3. *P. petiolata.*

1. Pluchea foètida (L.) B.S.P. Viscid Marsh Fleabane. (Fig. 3839.)

Baccharis foetida L. Sp. Pl. 861. 1753.
Baccharis viscosa Walt. Fl. Car. 202. 1788.
Pluchea bifrons DC. Prodr. 5: 451. 1836.
Pluchea foetida B.S.P. Prel. Cat. N. Y. 28. 1888.

Root perennial; stem simple or sparingly branched at the summit, puberulent and slightly viscid, 1½°–3° high. Leaves oblong, ovate or ovate-lanceolate, closely sessile and more or less cordate-clasping at the base, obtuse or acute at the apex, sharply denticulate, pubescent or puberulent, 2′–4′ long, ½′–1½′ wide, reticulate-veiny; clusters of heads sessile, or stalked, compact, leafy-bracted; involucre 2½″–3″ high, its bracts lanceolate, acute, viscid-puberulent.

In swamps, southern New Jersey to Florida and Texas, mainly near the coast. Also in the West Indies. July–Sept.

2. Pluchea camphoràta (L.) DC. Spicy or Salt-marsh Fleabane. (Fig. 3840.)

Erigeron camphoratum L. Sp. Pl. Ed. 2, 1212. 1763.
Pluchea camphorata DC. Prodr. 5: 451. 1836.

Root annual; stem usually branched, finely viscid-puberulent, or nearly glabrous, 2°–3° high, somewhat channeled. Leaves ovate, oblong or lanceolate, puberulent or glabrous, acute or acuminate at the apex, narrowed at the base, short-petioled, or the upper sessile but not clasping, 3′–8′ long, 1′–3′ wide, serrate or denticulate, not conspicuously reticulate-veined; heads about 3″ high, rarely leafy-bracted, mostly in naked open corymbiform cymes; bracts of the involucre ovate-lanceolate, or lanceolate, acute, puberulent; flowers purplish; achenes pubescent.

In salt marshes, coast of Massachusetts to Florida, Texas and Mexico. Also in the West Indies. Called also Ploughman's-wort. Aug.–Oct.

3. Pluchea petiolàta Cass. Inland Marsh Fleabane. (Fig. 3841.)

Pluchea petiolata Cass. Dict. Sci. Nat. 42: 2. 1826.
Pluchea foetida DC. Prodr. 5: 452. 1830.

Similar to the preceding species, but glabrate, usually taller, 2½°–4° high, the stem stout, rather strongly channelled. Leaves ovate-lanceolate to oval, thin, 4′–10′ long, 1½′–3′ wide, mostly acuminate at the apex, cuneate-narrowed at the base, long-petioled, irregularly serrate; petioles of the larger leaves 8″–12″ long; heads 2″–2½″ high, in terminal and often also axillary clusters; bracts of the involucre granular, ciliate; achenes short-pubescent.

In moist soil, often in woods, Virginia to Florida, Illinois, Missouri and the Indian Territory. Aug.–Oct.

43. ANTENNÀRIA Gaertn. Fruct. & Sem. 2: 410. *pl. 167.* 1791.*

Perennial woolly dioecious or polygamo-dioecious herbs, with alternate and basal leaves, and small discoid many-flowered heads usually capitate, glomerate or corymbose. Involucre oblong, ovoid or campanulate, its bracts scarious, imbricated in several series, the outer shorter, usually woolly. Receptacle convex, or nearly flat, foveolate, not chaffy. Staminate flowers with a truncate or minutely dentate corolla, usually undivided style and scanty pappus of club-shaped smooth or minutely barbed bristles. Pistillate or perfect flowers with tubular mostly 5-toothed corollas, 2-cleft style, and copious pappus of capillary naked bristles, slightly united at the base. Achenes oblong, terete, or slightly compressed. [Latin, in allusion to the fancied resemblance of the sterile pappus to insect antennae.]

About 36 species, natives of the north temperate zone and southern South America. In addition to the following, about a dozen others occur in the western parts of North America, and one in the southern states.

* Pappus-bristles of sterile flowers with club-shaped or dilated tips.
† Plant not stoloniferous; basal leaves oblanceolate. 1. *A. Carpathica.*
†† Plants stoloniferous, growing in patches.
Basal leaves 4″–1½′ long, 1½″–6″ wide, 1-nerved, or indistinctly 3-nerved.
Involucral bracts of fertile heads dark brownish green, lanceolate, acute or acuminate; plant 1′–4′ high. 2. *A. alpina.*
Involucral bracts all light green, or light brown, with white or pinkish scarious tips.
Bracts all elliptic or oblong, mostly obtuse; plant 2′–8′ high. 3. *A. dioica.*
Bracts of fertile heads lanceolate, mostly acute.
Basal leaves spatulate, petiole distinct; fertile plant about 1° high. 4. *A. neodioica.*
Basal leaves obovate or oblanceolate, without distinct petioles.
Stem of fertile plant slender, about 1° high; stolons long and slender; basal leaves oblanceolate. 5. *A. neglecta.*
Stems all stout, 2′–6′ high; stolons short; basal leaves obovate. 6. *A. campestris.*
Basal leaves mostly more than 1½′ long and ½′ wide, distinctly 3-nerved. 7. *A. plantaginifolia.*
* * Pappus-bristles of sterile flowers not dilated, barbellate; plant about 1′ high, tufted; head solitary. 8. *A. dimorpha.*

1. Antennaria Carpáthica (Wahl.) Hook. Carpathian Everlasting. (Fig. 3842.)

Gnaphalium Carpathicum Wahl. Fl. Carp. 258. *pl. 3.* 1814.
Antennaria Carpathica Hook. Fl. Bor. Am. 1: 329. 1833.

Plant floccose-woolly throughout, not stolouiferous; stem 2′–10′ high, simple. Basal leaves oblanceolate or oblong, obtuse or acutish at the apex, narrowed at the base into short petioles, 1′–2′ long, 2″–4″ wide; stem-leaves linear, acute or acutish, erect, the upper gradually smaller; heads in a terminal subcapitate cluster, or rarely solitary, 2½″–3″ broad; involucre 2″–3″ high, woolly at the base, its bracts brownish purple, the inner ones of the fertile heads mostly acutish, those of the sterile heads mainly obtuse.

In dry soil, Labrador and Anticosti to Hudson Bay. Also in Europe and northern Asia. May–Sept.

* Text contributed by Mr. P. A. RYDBERG.

2. Antennaria alpina (L.) Gaertn. Alpine Everlasting. (Fig. 3843.)

Gnaphalium alpinum L. Sp. Pl. 856. 1753.
Antennaria alpina Gaertn. Fr. & Sem 2: 410. 1791.

Surculose by short stolons; stems floccose-woolly, 1′–4′ high. Basal leaves usually numerous, tufted, spatulate or linear-oblong, obtuse, silvery-woolly on both sides, or glabrate and green above, 4″–12″ long; stem leaves linear and small, few, sessile, woolly; heads in a terminal capitate, or seldom somewhat corymbose cluster, rarely solitary, 2″–2½″ broad; involucre about 2½″ high, the bracts of the fertile heads dark brownish-green, the inner ones acute or acuminate; those of the sterile heads lighter, brownish, broader and obtuse; achenes glandular.

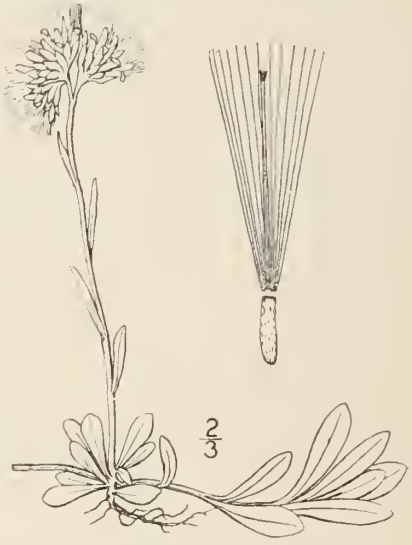
Labrador and Arctic America to Alaska, south in the Rocky Mountains to Colorado and in the Sierra Nevada to California. April–Aug.

3. Antennaria dioica (L.) Gaertn. Mountain Everlasting or Cudweed. (Fig. 3844.)

Gnaphalium dioicum L. Sp. Pl. 850. 1753.
Antennaria dioica Gaertn. Fr. & Sem. 2: 410. *pl. 167. f. 3.* 1791.

Floccose-woolly or canescent, surculose, forming broad patches. Flowering stems 2′–12′ high; basal leaves spatulate or obovate, obtuse, narrowed into short petioles, white-canescent on both sides, or sometimes green but rarely glabrous above, 4″–15″ long, 1″–4″ wide; stem-leaves linear, sessile; heads 3″–4″ broad in a terminal capitate or corymbose cluster; involucre 2″–3″ high, the bracts of the fertile heads oblong, white or pink, all obtuse, or the inner ones acute; those of the sterile heads oval or elliptical, obtuse; achenes glabrous, or minutely glandular.

Labrador and Newfoundland to Alaska, south in the Rocky Mountains to New Mexico and Arizona, and in the Sierra Nevada to southern California. Also in Europe and Asia. Called also Moor Everlasting, Cat's-ear, Cat's-foot, Cat's-paws, Cotton-weed. May–Aug.



4. Antennaria neodioica Greene. Smaller Cat's-foot. (Fig. 3845.)

Antennaria neodioica Greene, Pittonia, 3: 184. 1897.

Floccose-woolly, with numerous stolons which are leafy throughout. Stem of fertile plants slender, about 1° high; basal leaves about 1′ long, 3″–5″ wide, broadly obovate to spatulate, 1-nerved, or indistinctly 3-nerved, white-tomentose beneath, generally pale and glabrate above, narrowed into distinct petioles; stem-leaves linear, acute; heads loosely corymbose, 3″–4″ broad; outermost bracts of the involucre obtuse, the rest lanceolate, acute, or acuminate, all greenish or brownish below, with white tips; achenes obtusely 4-angled, granular-papillose. Sterile plant lower, 3′–8′ high; heads more densely clustered; bracts of the involucre oblong, obtuse.

In dry shaded places, often growing with *A. plantaginifolia*, Quebec to Virginia, west to South Dakota. Also in Europe ? April–July.

5. Antennaria neglécta Greene. Field Cat's-foot. (Fig. 3846.)

Antennaria neglecta Greene, Pittonia, 3: 173. 1897.

Stoloniferous, the stolons long and slender, bearing small leaves, except at the ends, where they are normally developed. Basal leaves oblanceolate, or cuneate-spatulate, gradually tapering to a sessile base, without a distinct petiole, white-tomentose beneath, glabrate above, 1-nerved; stem-leaves linear; fertile plant nearly 1° high; heads 3″–4″ broad, corymbose; bracts brownish, with white tips, lanceolate, acute; sterile plant 4′–8′ high, the heads densely clustered, the bracts oblong, obtuse.

In fields and pastures, Maine to New York, Virginia and Wisconsin. April–June.

6. Antennaria campéstris Rydberg. Prairie Cat's-foot. (Fig. 3847.)

Antennaria campestris Rydberg, Bull. Torr. Club, 24: 304. 1897.

Stolons short, leafy; flowering stems of both fertile and sterile plants 2′–6′ high; basal leaves obovate-cuneate, without a distinct petiole, white-tomentose beneath, glabrate above, 1-nerved, or indistinctly 3-nerved; stem-leaves small, linear; heads 3″–4″ broad in subcapitate clusters; bracts of the fertile heads lanceolate, greenish below, brownish at the middle, the apex white, acute or acuminate; bracts of sterile heads elliptic, obtuse.

On dry prairies, Nebraska to the Saskatchewan. May–June.

7. Antennaria plantaginifòlia (L.) Richards. Plantain-leaf Everlasting. Mouse-ear Everlasting. (Fig. 3848.)

Gnaphalium plantaginifolium L. Sp. Pl. 850. 1753.
Antennaria plantaginifolia Richards. App. Frank. Journ. Ed. 2, 30. 1823.
Antennaria Parlinii Fernald, Gard. & For. 10: 284. 1897.

Floccose-woolly, stoloniferous, forming broad patches, the patches of sterile and fertile plants commonly distinct. Flowering stems of fertile plant, 6′–18′ high; basal leaves obovate or spatulate, or broadly oval, obtuse, distinctly 3-ribbed, petioled, often glabrate and dark green above, silvery beneath, 1½′–3′ long, 5″–18″ wide; stem-leaves sessile, oblong or lanceolate, the upper usually small and distant; heads in corymbose or often subcapitate clusters, 4″–5″ broad; involucre about 3″ high, its bracts greenish-white, lanceolate, acute or acutish; achenes minutely glandular; sterile plant smaller, 3′–8′ high; basal leaves somewhat smaller; stem-leaves mostly linear; heads smaller, 3″–4″ broad; bracts oblong, obtuse.

In dry soil, especially in open woods, Labrador to Florida, west to Nebraska and Texas. Called also Spring or Early Everlasting, White Plantain, Pussy-toes, Ladies' Tobacco. April–June.

8. Antennaria dimórpha (Nutt.) T. & G. Low Everlasting. (Fig. 3849.)

Gnaphalium dimorphum Nutt. Trans. Am. Phil. Soc. (II) 7: 405. 1841.
A. dimorpha T. & G. Fl. N. A. 2: 431. 1843.

Tufted from a thick woody often branched caudex, 1′–1½′ high. Leaves all in a basal cluster, spatulate, white-canescent or tomentose on both sides, obtuse or acutish, ½′–1′ long, 1″–2″ wide, narrowed into short petioles; heads of staminate flowers about 3″ broad and high, solitary and sessile among the leaves, or raised on a very short sparingly leafy stem, with obtuse or obtusish brownish involucral bracts, those of pistillate flowers longer, their inner bracts linear-lanceolate, acuminate; pappus of the staminate flowers slender, scarcely thickened, but barbellate at the tips, that of the pistillate flowers of fine and smooth bristles.

Dry soil, Nebraska to Utah and California, north to Montana and British Columbia. April–June.

44. ANÁPHALIS DC. Prodr. 6: 241. 1837.

Perennial white-tomentose or woolly herbs, with leafy erect stems, in our species, alternate entire leaves, and small corymbose discoid heads of dioecious flowers. Involucre oblong to campanulate, its bracts scarious, imbricated in several series, mostly white, the outer shorter. Receptacle mostly convex, not chaffy. Staminate flowers with a slender or filiform corolla, an undivided style, and a pappus of slender bristles, not thickened at the summit, or scarcely so; anthers tailed at the base. Pistillate flowers with a tubular 5-toothed corolla, 2-cleft style, and a copious pappus of capillary separate bristles. Achenes oblong. [Greek name of some similar plant.]

About 30 species, natives of the north temperate zone. Only the following is known to occur in North America.

1. Anaphalis margaritàcea (L.) Benth. & Hook. Pearly or Large-flowered Everlasting. (Fig. 3850.)

Gnaphalium margaritaceum L. Sp. Pl. 850. 1753.
Antennaria margaritacea Hook. Fl. Bor. Am. 1: 329. 1833.
A. margaritacea Benth. & Hook. Gen. Pl. 2: 303. 1873.

Stem floccose-woolly, corymbosely branched at the summit, leafy, 1°–3° high. Leaves linear-lanceolate, narrowed to a sessile base, revolute, green, but more or less pubescent above, woolly beneath, 3′–5′ long, 2″–4″ wide, the lowest shorter, spatulate, usually obtuse; corymb compound, 2′–8′ broad; heads very numerous, short-peduncled or sessile, about 3″ high, 4″ broad when expanded; involucre campanulate, its bracts ovate-lanceolate, obtuse, finely striate, pearly white, mostly glabrous; pappus-bristles of the fertile flowers distinct and falling away separately.

Dry soil, Newfoundland to Alaska, North Carolina, Kansas, California and northern Asia. Adventive in Europe. Silver-leaf, Life Everlasting, Moonshine, Cotton-weed, None-so-pretty. July–Sept.

45. GNAPHÀLIUM L. Sp. Pl. 850. 1753.

Woolly erect or diffusely branched herbs, with alternate leaves, and discoid heads of pistillate and perfect flowers arranged in corymbs, spikes, racemes, or capitate. Receptacle flat, convex or conic, not chaffy, usually foveolate. Pistillate flowers in several series, their corollas filiform, minutely dentate or 3–4-lobed. Central flowers perfect, tubular, few, their corollas 5-toothed or 5-lobed. Anthers sagittate at the base, the auricles tailed. Achenes oblong or obovate, terete or slightly compressed, not ribbed. Pappus a single series of capillary bristles, sometimes thickened above, cohering at the base, or separately deciduous. [Greek, referring to the wool.]

About 120 species, widely distributed, known as Cudweed, Cotton-weed, or Everlasting.

Tall, erect; inflorescence corymbose, or paniculate; pappus-bristles distinct.
- Leaves sessile; plant not viscid. — 1. *G. obtusifolium.*
- Leaves sessile; plant glandular-viscid. — 2. *G. Helleri.*
- Leaves decurrent; plant glandular-viscid. — 3. *G. decurrens.*

Low, diffuse; inflorescence mostly capitate; pappus-bristles distinct.
- Floccose-woolly; involucral bracts yellowish, or white. — 4. *G. palustre.*

Appressed-woolly; involucral bracts becoming dark brown. 5. *G. uliginosum.*
Tufted low mountain herbs; heads few; bracts brown; pappus-bristles distinct. 6. *G. supinum.*
Slender, simple; heads spicate; pappus-bristles united at base.
Leaves linear or lanceolate-spatulate, acute; heads about 3″ high; northeastern.
Bracts dark brown; stem leaves lanceolate-spatulate. 7. *G. Norvegicum.*
Bracts brownish tipped; stem leaves linear. 8. *G. sylvaticum.*
Leaves spatulate, obtuse or obtusish; heads 2″ to 2½″ high; eastern and southern. 9. *G. purpureum.*

1. Gnaphalium obtusifòlium L. Sweet or White Balsam. Sweet or Fragrant Life Everlasting. (Fig. 3851.)

Gnaphalium obtusifolium L. Sp. Pl. 851. 1753.
G. polycephalum Michx. Fl. Bor. Am. 2: 127. 1803.

Annual or winter-annual, fragrant; stem erect, simple, or branched above, tomentose, 1°–3° high. Leaves lanceolate or linear-lanceolate, sessile, acute or acutish, or the lower obtuse at the apex, narrowed at the base, densely white-woolly beneath, glabrate and commonly dark green above, 1′–3′ long, 2″–4″ wide, the margins undulate; heads in numerous corymbose or paniculate clusters of 1–5, about 3″ high; bracts of the involucre white, or tinged with brown, oblong, thin and scarious, obtuse, the outer woolly at the base; pappus-bristles distinct, separately deciduous; achenes glabrous.

In dry, mostly open places, Nova Scotia to Florida, Manitoba, Missouri and Texas. Other names are Poverty-, Chafe- or Balsam-weed, Old-field Balsam, Indian Posey. Leaves of winter rosettes oblong. Aug.–Sept.

2. Gnaphalium Hélleri Britton. Heller's Everlasting. (Fig. 3852.)

G. Helleri Britton, Bull. Torr. Club, 20: 280. 1893.

Similar to the preceding species, corymbosely or somewhat paniculately branched above, 1½°–2° high, the stem and branches densely glandular-pubescent, not tomentose. Leaves oblong-lanceolate, sessile, acuminate at both ends, green and hispidulous above, white-tomentose beneath, the larger about 2′ long and 5″ wide, the uppermost much smaller and narrower; heads very numerous, corymbose or corymbose-paniculate, sessile or short-peduncled in the clusters, about 2½″ broad; involucre oblong, or becoming campanulate, 3″ high, its bracts bright white, tomentose, the outer oblong, the inner linear-oblong, all obtuse; pappus-bristles distinct to the base, separately deciduous; achenes glabrous.

In fields, southeastern Virginia to Georgia. Sept.–Oct.

3. Gnaphalium decúrrens Ives. Clammy Everlasting. Winged Cudweed. (Fig. 3853.)

Gnaphalium decurrens Ives, Am. Journ. Sci. 1: 380. *pl. 1.* 1819.

Annual or biennial, similar to the two preceding species, fragrant; stem very leafy, glandular-viscid, corymbosely branched above, 2°–3° high. Leaves lanceolate or broadly linear, acutish at the apex, densely white-woolly beneath, glabrate or loosely woolly above, sessile and decurrent on the stem at the base, 1′–3′ long, 2″–3″ wide, or the lowest shorter and slightly spatulate; heads in several or numerous corymbose glomerules of 2–6, about 3″ high; bracts of the involucre white or brownish, ovate, acutish or the inner lanceolate and acute, the outer woolly at the base; pappus-bristles distinct, separately deciduous; achenes glabrous.

In open, moist or dry places, Nova Scotia to Pennsylvania, west to western Ontario, Michigan and British Columbia, south in the Rocky Mountains to Arizona. Also called Sweet Balsam and Balsam-weed. July–Sept.

4. Gnaphalium palústre Nutt. Western Marsh Cudweed. (Fig. 3854.)

Gnaphalium palustre Nutt. Trans. Am. Phil. Soc. (II) 7: 403. 1841.

Annual; diffusely branched from the base, densely but loosely floccose-woolly all over, 2′–8′ high. Leaves sessile, oblong, linear-oblong, or the lower spatulate, obtuse or acutish, 6″–12″ long, 1½″–3″ wide; heads about 2″ high, several together in leafy-bracted glomerules; involucre more or less woolly, its bracts linear or lanceolate, acute, white or pale yellow; pappus-bristles distinct, separately deciduous.

In moist wet soil, Northwest Territory to western Nebraska and New Mexico, west to British Columbia and California. May–Aug.

5. Gnaphalium uliginòsum L. Low or Marsh Cudweed. Wartwort. Mouse-ear. (Fig. 3855.)

Gnaphalium uliginosum L. Sp. Pl. 856. 1753.

Annual; diffusely branched from the base, or the stems sometimes erect or ascending, appressed-woolly all over, 2′–8′ high. Leaves sessile, spatulate-linear, linear, or the lower oblanceolate or spatulate and narrowed into petioles, all obtuse or obtusish, generally mucronulate, 1′–1½′ long; heads about 2″ high, numerous in dense leafy-bracted terminal glomerules; bracts of the involucre oblong or oblong-lanceolate, brown, the outer obtuse or obtusish and more or less woolly, the inner acute; pappus-bristles distinct, separately deciduous.

In damp soil, Newfoundland to Virginia, west to western Ontario, Minnesota and Indiana. Apparently naturalized from Europe, where it is common. Occurs also in the far Northwest, where it is probably indigenous. July–Sept.

6. Gnaphalium supìnum L. Dwarf Cudweed. (Fig. 3856.)

Gnaphalium supinum L. Syst. Ed. 2, 234. 1767.

Perennial, white-woolly, much tufted; stems simple, 1′–3½′ high. Leaves mainly basal, linear, acute, narrowed at the base, sessile, 6″–12″ long, 1″–2″ wide; heads few or several, capitate or short-spicate, about 3″ high; flowers yellowish; bracts of the involucre brown, glabrous, lanceolate or oblong-lanceolate, acute; pappus-bristles distinct, separately deciduous.

Alpine summits of the White Mountains of New Hampshire; Labrador and Greenland, and on high mountains in Europe and Asia. Called also Mountain Cudweed. July–Aug.

7. Gnaphalium Norvégicum Gunner. Norwegian Cudweed. (Fig. 3857.)

Gnaphalium Norvegicum Gunner, Fl. Norveg. 2: 105. 1772.

Perennial; stem simple, 6′–18′ high. Leaves lanceolate to spatulate, elongated, acute, narrowed at the base, woolly on both sides, or green and glabrate above, 3′–6′ long, 2″–5″ wide, the lower and basal ones petioled; heads about 3″ high, numerous in a more or less leafy spike, the lowest often distant, solitary or glomerate in the upper axils; bracts of the involucre ovate-oblong, dark brown, or brown-tipped, glabrous or slightly woolly, obtuse; pappus-bristles united at the base, falling away in a ring; achenes hispidulous.

Mt. Albert, Gaspé, Quebec, north to Greenland and Arctic America. Also in Europe. July–Aug.

8. Gnaphalium sylváticum L. Wood Cudweed. Chafeweed. Owl's Crown. Golden Mother-wort. (Fig. 3858.)

Gnaphalium sylvaticum L. Sp. Pl. 856. 1753.

Perennial; stem slender, simple, 6′–18′ high. Leaves linear, acute, 1′–2′ long, about 1″ wide, or the lowest linear-spatulate, woolly beneath, glabrous or glabrate above; heads about 3″ high, numerous in a more or less leafy spike, or the lowest solitary or glomerate in the upper axils; bracts of the involucre linear-oblong, obtuse, mostly glabrous, yellowish or greenish with a brown spot at or just below the apex; pappus-bristles united at the base; achenes hispidulous.

New Brunswick and Cape Breton Island, perhaps introduced from Europe. Widely distributed in Europe and Northern Asia. June–Aug.

9. Gnaphalium purpùreum L. Purplish Cudweed. (Fig. 3859.)

Gnaphalium purpureum L. Sp. Pl. 854. 1753.

Annual or biennial, simple and erect, or branched from the base and the branches ascending, 2′–2° high. Leaves spatulate, or the uppermost linear, mostly obtuse, mucronulate, woolly beneath, usually green and glabrous or nearly so above when old, sessile, or the lowest narrowed into petioles, 1′–2′ long, 2″–6″ wide; heads 2″–2½″ high in a terminal, sometimes leafy, often interrupted spike, or the lowest ones distant and axillary; bracts of the involucre yellowish brown or purplish, lanceolate-oblong, acute or acutish, the outer woolly at the base; pappus-bristles united below; achenes roughish.

In dry sandy soil, eastern Maine to Florida, west to Pennsylvania, West Virginia, Kentucky, Arkansas, Texas and Mexico. Also on the Pacific Coast and in South America. May–Sept.

46. ADENOCAÙLON Hook. Bot. Misc. 1: 19. 1830.

Perennial herbs, with broad alternate slender-petioled leaves, woolly beneath, and paniculed small heads of tubular flowers. Involucre campanulate, composed of a few herbaceous bracts. Receptacle nearly flat, naked. Corollas all tubular, 4–5-lobed. Marginal flowers pistillate, fertile. Central flowers perfect, sterile, the style undivided; anthers slightly sagittate at the base. Pappus none. Achenes obovoid or clavate, very obtuse, faintly nerved, glandular above, longer than the bracts of the involucre. [Greek, gland-stem.]

About 3 species, natives of North America, Japan, the Himalayas and Chile. Only the following is known in North America.

1. Adenocaulon bícolor Hook. Adenocaulon. (Fig. 3860.)

Adenocaulon bicolor Hook. Bot. Misc. 1: 19. *pl. 15.* 1830.

Stem floccose-woolly, or at length glabrous, 1°–3° high, leafless and mostly paniculately branched above. Leaves all basal or nearly so, deltoid-ovate, obtuse or acute at the apex, deeply cordate at the base, coarsely repand-toothed or lobed, thin, green and glabrous above, densely and persistently white-woolly beneath, 2′–6′ long and broad, with slender narrowly margined petioles; heads numerous, very slender-peduncled, small; bracts of the involucre 4 or 5, ovate to lanceolate, reflexed in fruit, at length deciduous; achenes 3″–4″ long, ½″ thick, the upper part beset with nail-shaped glands.

In moist woods, Northern Michigan and Lake Superior to British Columbia and California. May–July.

47. ÍNULA L. Sp. Pl. 881. 1753.

Perennial, mostly tomentose or woolly herbs, with alternate and basal leaves, and large heads of both tubular and radiate yellow flowers. Involucre hemispheric or campanulate, its bracts imbricated in several series, the outer often foliaceous. Receptacle flat or convex, areolate or foveolate, not chaffy. Ray-flowers pistillate, their ligules 3-toothed. Disk-flowers perfect, their corollas tubular, 5-toothed. Anthers sagittate at the base, the auricles caudate. Style-branches of the disk-flowers linear, obtuse. Achenes 4–5-ribbed; pappus of capillary rough bristles in our species. [The ancient Latin name.]

About 90 species, natives of Europe, Asia and Africa.

1. Inula Helènium L. Elecampane. Horseheal. (Fig. 3861.)

Inula Helenium L. Sp. Pl. 881. 1753.

Stems tufted from large thick roots, simple or rarely somewhat branched, 2°–6° high, densely pubescent above. Leaves large, broadly oblong, rough above, densely pubescent beneath, denticulate, the basal ones acute at each end, long-petioled, 10′–20′ long, 4′–8′ wide; stem leaves sessile, or cordate-clasping at the base, acute at the apex, smaller; heads solitary, or few, terminal, stout-peduncled, 2′–4′ broad; involucre hemispheric, nearly 1′ high, its outer bracts ovate, foliaceous, pubescent; rays numerous, linear; achenes glabrous, 4-sided.

Along roadsides and in fields, Nova Scotia to Ontario and Minnesota, south to North Carolina and Missouri. Naturalized from Europe. Native also in Asia. Called also Scabwort, Horse-elder, Yellow Starwort, Elfdock.

48. POLÝMNIA L. Sp. Pl. 926. 1753.

Perennial herbs (some tropical species woody), with opposite membranous lobed or angled leaves, or the lower alternate, and mostly large corymbose-paniculate heads of both tubular and radiate yellow or whitish flowers, or rays sometimes wanting. Involucre hemispheric or broader, of about 5 large outer bracts, and more numerous smaller inner ones. Receptacle chaffy. Ray-flowers pistillate, fertile, subtended by the inner involucral bracts, the ligules elongated, minute, or none. Disk-flowers subtended by the chaffy scales of the receptacle, perfect, sterile, their corollas tubular, 5-toothed. Anthers 2-toothed at the base. Pappus none. Achenes thick, short, turgid, glabrous. [From the Muse Polhymnia.]

About 10 species, natives of America. Only the following are known in North America.

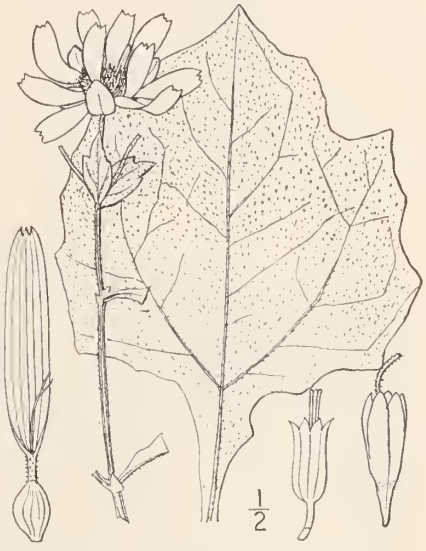
Rays commonly 6″ long or more, yellow; achenes strongly striate. 1. *P. Uvedalia.*
Rays commonly minute and whitish, or none; achenes 3-ribbed. 2. *P. Canadensis.*

1. Polymnia Uvedàlia L. Yellow or Large-flowered Leaf-cup. (Fig. 3862.)

Polymnia Uvedalia L. Sp. Pl. Ed. 2, 1303. 1763.

Rough-pubescent, stout, branched, 3°–10° high. Leaves broadly ovate or deltoid, 3-nerved, abruptly contracted above the base, minutely ciliate, more or less pubescent on both sides, angulate-lobed, the lower often 1° long and broad, petioled, the upper sessile, somewhat clasping; heads few in terminal clusters, peduncled, 1½′–3′ broad; rays 10–15, commonly 6″–12″ long, linear-oblong, bright yellow, 3-toothed or entire; exterior bracts of the cup-like involucre ovate-oblong, obtuse, ciliate, 4″–10″ long; achenes slightly oblique and laterally compressed, strongly striate, nearly 3″ long.

In rich woods, New York to Indiana, and Michigan (according to Wright), south to Florida, Missouri and Texas. Called also Yellow Bearsfoot. July–Aug.



2. Polymnia Canadénsis L. Small-flowered Leaf-cup. (Fig. 3863.)

Polymnia Canadensis L. Sp. Pl. 926. 1753.

Rather slender, viscid-pubescent, at least above, simple or branched, 2°–5° high. Leaves deltoid-ovate to hastate, usually very thin, all petioled, deeply angulate-lobed and the lobes dentate, or the lower lyrate-pinnatifid, 4′–10′ long, the uppermost sometimes ovate and entire or merely denticulate; heads few in terminal clusters, short-peduncled or sessile, 4″–6″ broad; outer bracts of the involucre ovate to lanceolate, obtuse or acutish, 2″–3″ long; rays small, minute or none, whitish or yellowish; achenes 3-angled, obovoid, obcompressed, 3-ribbed, not striate.

In damp, rich shaded places, western Ontario to Minnesota, North Carolina and Arkansas. June–Sept.

Polymnia Canadénsis radiàta A. Gray, Syn. Fl. N. A. 1: Part 2, 238. 1884.
Ligules larger, sometimes 6″ long, 3-lobed, nearly white. Occasional in the range of the type.

49. MELAMPÒDIUM L. Sp. Pl. 921. 1753.

Herbs, some species woody, with opposite entire or dentate leaves, and terminal peduncled heads of both tubular and radiate, white or yellow flowers in our species. Involucre hemispheric, its bracts in 2 series, the 4 or 5 outer ones broad, often connate at the base, the inner hooded, embracing or permanently surrounding the pistillate fertile ray-flowers. Receptacle convex or conic, chaffy. Ray-flowers in 1 series, the rays spreading, 2–3-lobed or entire. Disk-flowers perfect, sterile, their corollas with a narrowly campanulate 5-toothed limb, the anthers entire at the base, the style undivided. Achenes obovoid, more or less incurved. Pappus none. [Greek, black-foot, without significance.]

About 25 species, natives of the warmer parts of America. Besides the following, some 4 others occur in the southwestern United States.

1. Melampodium cinèreum DC.
Pale Melampodium.
(Fig. 3864.)

Melampodium cinereum DC. Prodr. 5: 518. 1836.

Perennial, woody at the base, branched, canescent, 4′–12′ high, the branches slender. Leaves linear, lanceolate, or the lower spatulate, sessile, entire, undulate or sinuate, 1′–2′ long, 1½″–3″ wide, obtuse or obtusish at the apex; heads 8″–14″ broad, terminating the branches; peduncles slender, 1′–3′ long; outer bracts of the involucre ovate or oval, obtuse, united below; rays 5–9, cuneate-oblong, white, 2–3-lobed; inner bracts turbinate or terete, hooded, muricate, the hood wider than the body.

In dry soil, Kansas to Arizona, Texas and Mexico. June–Oct.

50. SÍLPHIUM L. Sp. Pl. 919. 1753.

Tall perennial herbs, with resinous juice, opposite or alternate leaves, and large corymbose or paniculate (rarely solitary) peduncled heads of both tubular and radiate yellow flowers. Involucre hemispheric or campanulate, its bracts imbricated in few series. Receptacle flat or nearly so, chaffy, the chaff subtending the disk-flowers. Ray-flowers in 2 or 3 series, pistillate, fertile, the ligules numerous, linear. Disk-flowers perfect but sterile, their corollas tubular, 5-toothed, the style undivided. Anthers minutely 2-toothed or entire at the base. Achenes broad, dorsally flattened, 2-winged, notched at the apex. Pappus none, or of 2 awns confluent with the wings of the achene. [Greek, from the resinous juice.]

About 12 species, natives of North America, known as Rosin-weed or Rosin-plant.

Stem leafy, the leaves opposite, alternate, or verticillate.
- Leaves, or their petiole-bases, connate-perfoliate; stem square. — 1. *S. perfoliatum.*
- Leaves not connate-perfoliate, sessile or petioled.
  - Leaves opposite, or the uppermost alternate; cauline sessile. — 2. *S. integrifolium.*
  - Leaves, or some of them, verticillate in 3's or 4's, petioled. — 3. *S. trifoliatum.*
  - Most or all of the leaves alternate, entire or dentate. — 4. *S. Asteriscus.*
  - Leaves all alternate, pinnatifid or bipinnatifid, large. — 5. *S. laciniatum.*

Stem leafless or nearly so, scaly above; leaves basal, large. — 6. *S. terebinthinaceum.*

1. Silphium perfoliàtum L.
Cup-plant. Indian-cup.
(Fig. 3865.)

S. perfoliatum L. Sp. Pl. Ed. 2, 1301. 1763.

Stem square, glabrous, or rarely somewhat hispid, branched above, or sometimes simple, 4°–8° high. Leaves ovate or deltoid-ovate, opposite, the upper connate-perfoliate, the lower abruptly contracted into margined petioles, all thin, usually scabrous on both sides, or pubescent beneath, coarsely angulate-dentate, or the upper entire, the larger 6′–12′ long, 4′–8′ wide; heads commonly numerous, 2′–3′ broad; rays 20–30, about 1′ long and 2″ wide; involucre depressed-hemispheric, its outer bracts broad, ovate, ciliolate, spreading or erect; achenes obovate, emarginate, sometimes 2-toothed.

In moist soil, southern Ontario to Minnesota, south to Georgia, Nebraska and Louisiana. Naturalized near New York City. Called also Ragged Cup. July–Sept.

2. Silphium integrifòlium Michx. Entire-leaved Rosin-weed. (Fig. 3866.)

Silphium integrifolium Michx. Fl. Bor. Am. 2: 146. 1803.

Stem glabrous, rough or sometimes hirsute, corymbosely branched above, 2°–5° high. Leaves ovate to ovate-lanceolate, acute or acuminate, entire, denticulate or remotely dentate, rough above, pubescent or glabrous beneath, those of the stem all closely sessile, often half-clasping but not connate-perfoliate at the rounded base, 3′–5′ long, 1′–2′ wide; heads usually numerous, 1′–2′ broad; involucre nearly hemispheric, its outer bracts ovate or ovate-lanceolate, acute, spreading, ciliolate or pubescent; rays 15–25; achenes oval or obovate, 4″–5″ long, deeply emarginate.

On prairies, Ohio to Minnesota, south to Louisiana, Nebraska, Arkansas and Texas. Aug.–Sept.

3. Silphium trifoliàtum L. Whorled Rosin-weed. (Fig. 3867.)

Silphium trifoliatum L. Sp. Pl. 920. 1753.

Stem glabrous, sometimes glaucous, corymbosely branched at the summit, 4°–7° high. Leaves lanceolate or oblong-lanceolate, the middle ones almost always whorled in 3's or 4's, acuminate at the apex, narrowed at the base and usually somewhat petioled, rough or roughish above, pubescent or nearly glabrous beneath, entire or denticulate, 3′–7′ long, ½′–1½′ wide; heads several or numerous, 1½′–2′ broad; involucre hemispheric, its outer bracts ovate or oval, acute or obtuse, glabrous, or slightly pubescent, ciliolate; rays 15–20; achenes oval or obovate, narrowly winged, emarginate, sharply 2-toothed.

In woods, Pennsylvania to Ohio, south to Virginia and Alabama. July–Oct.

4. Silphium Asteriscus L. Starry Rosin-weed. (Fig. 3868.)

Silphium Asteriscus L. Sp. Pl. 920. 1753.

Stem hispid-pubescent, simple, or branched above, 2°–4° high, usually purple. Leaves nearly all alternate, ovate, ovate-oblong, or lanceolate, acute or obtusish, sessile, somewhat clasping, or the lower narrowed into short petioles, dentate, or the upper entire, 2′–5′ long, ½′–1′ wide; heads commonly few, 1′–2′ broad; rays 12–15; involucre hemispheric, its bracts mostly hispid, ovate to oblong, acute or obtuse, squarrose; achenes oval or obovate, narrowly winged, 2-toothed.

In dry soil, Maryland to Tennessee and Missouri, south to Florida and Louisiana. June–Sept.

5. Silphium laciniàtum L. Compass-plant. Pilot-weed. (Fig. 3869.)

Silphium laciniatum L. Sp. Pl. 919. 1753.

Rough or hispid, very resinous; stem 6°–12° high; basal leaves pinnatifid or bipinnatifid, long-petioled, 1° long or more, the lobes oblong or lanceolate; stem leaves alternate, vertical, their edges tending to point north and south, sessile, or the lower short-petioled, the upper cordate-clasping at the base, gradually smaller and less divided; heads several or numerous, sessile or short-peduncled, 2′–5′ broad, the peduncles bracted at the base; rays 20–30, 1′–2′ long; involucre nearly hemispheric, its bracts large, rigid, lanceolate or ovate, very squarrose; achenes oval, about 6″ long, the wing broader above than below, notched at the apex, awnless.

On prairies, Ohio to South Dakota, south to Alabama, Louisiana and Texas. Called also Turpentine-weed, Polar-plant, Rosin-weed. July–Sept.

6. Silphium terebinthinàceum Jacq. Prairie Dock. Prairie Burdock. (Fig. 3870.)

Silphium terebinthinaceum Jacq. Hort. Vind. 1: *pl. 43.* 1770.

Stem glabrous or nearly so, branched and scaly above, 4°–10° high. Leaves all basal or nearly so, coriaceous, ovate, mostly long-petioled, acute at the apex, cordate at the base, rough on both sides, often 12′ long and 6′ wide, sharply dentate; heads numerous, 1½′–3′ broad, borne on glabrous peduncles; involucre hemispheric, its bracts ovate-oblong, erect, glabrous or minutely pubescent; rays 12–20; achenes obovate, narrowly winged, slightly 2-toothed and emarginate at the apex.

On prairies and in dry woods, southern Ontario and Ohio to Minnesota, south to Georgia, Iowa and Louisiana. Called also Rosin-plant. July–Sept.

Silphium terebinthinàceum pinnatifidum (Ell.) A. Gray, Man. 220. 1848.

S. pinnatifidum Ell. Bot. S. C. & Ga. 2: 462. 1824.

Leaves laciniate or pinnatifid. Ohio to Georgia.

51. CHRYSÓGONUM L. Sp. Pl. 920. 1753.

Pubescent perennial herbs, with opposite and basal petioled leaves, and slender-peduncled-axillary and terminal, rather large heads of both tubular and radiate, yellow flowers. Involucre hemispheric, its bracts in 2 series of 5, the outer large, obovate or spatulate, foliaceous, the inner oval, firm, each subtending a pistillate ray-flower. Receptacle chaffy, each scale subtending and partly enclosing a perfect but sterile tubular flower with a 5-toothed corolla. Anthers nearly entire at the base. Achenes obovate, compressed, their margins acute, not winged, 1-nerved on the back, 1–2-ribbed on the inner side. Pappus a short half-cup-shaped crown. [Greek, golden-knee.]

A monotypic genus of eastern North America.

1. Chrysogonum Virginiànum L. Chrysogonum. (Fig. 3871.)

Chrysogonum Virginianum L. Sp. Pl. 920. 1753.

Perennial by rootstocks or runners, pubescent or hirsute throughout, branched from the base, or at first acaulescent, 3′–12′ high. Leaves ovate or oblong, obtuse or acutish at the apex, the upper sometimes subcordate at the base, crenate-dentate, rather thin, 1′–3′ long, ½′–2′ wide, the basal ones with petioles as long as the blade or longer, those of the upper ones shorter; peduncles 1′–4′ long; heads 1′–1½′ broad; outer bracts of the involucre obtuse; rays about 5, 4″–7″ long.

In dry soil, southern Pennsylvania to Florida. April–July.

Chrysogonum Virginiànum dentàtum A. Gray, Bot. Gaz. 7: 31. 1882.

Leaves dentate, the teeth and acutish apex mucronulate; outer bracts of the involucre acute. High Island, Potomac River, near Washington.

52. BERLANDIÈRA DC. Prodr. 5: 517. 1836.

Perennial canescent or pubescent herbs, with alternate leaves and rather large, peduncled solitary or corymbose heads of both tubular and radiate yellow flowers. Involucre depressed-hemispheric, its bracts imbricated in about 3 series, the outermost small, mostly oblong, the second series broader, oval or obovate, the inner membranous, similar, reticulated when mature, subtending the ray-flowers and exceeding the disk. Receptacle nearly flat, chaffy, the chaff subtending the disk-flowers. Ray-flowers 5–12, pistillate, fertile. Disk-flowers perfect, tubular, sterile, their corollas 5-toothed. Anthers entire, or minutely 2-toothed at the base. Style of the tubular flowers undivided, hirsute. Achenes obovate, compressed, not winged, 1-ribbed on the inner side, the pappus obsolete, early deciduous or of 2 caducous awns. [Named after J. L. Berlandier, a Swiss botanical collector in Texas and Mexico.]

About 5 species, natives of the southern United States and Mexico.

Stem leafy; leaves ovate to oblong, crenate. 1. *B. Texana.*
Plant acaulescent, or nearly so; leaves lyrate-pinnatifid. 2. *B. lyrata.*

1. Berlandiera Texàna DC. Texan Berlandiera. (Fig. 3872.)

Berlandiera Texana DC. Prodr. 5: 517. 1836.

Hirsute-pubescent throughout; stem erect, branched above, or simple, 2°–3° high, leafy. Leaves ovate, or the basal oblong, crenate, acutish or obtuse at the apex, rounded or cordate at the base, 2′–4′ long, 1′–2′ wide, the upper sessile, the lower petioled; heads few or several, 1′–1½′ broad, in a terminal corymbose-cymose cluster; peduncles ¼′–1½′ long; inner bracts of the involucre twice as large as the outer.

In dry soil, Missouri and Kansas to Arkansas and Louisiana. July–Aug.

2. Berlandiera lyràta Benth. Lyre-leaved Berlandiera. (Fig. 3873.)

Silphium Nuttallianum Torr. Ann. Lyc. N. Y. 2: 216. Name only. 1827.

Berlandiera lyrata Benth. Pl. Hartw. 17. 1839.

Finely whitish-canescent, acaulescent or short-stemmed; scapes or peduncles slender, 3′–8′ long, bearing a solitary head, or rarely 2. Leaves lyrate-pinnatifid, obtuse, petioled, the terminal segment usually larger than the lateral ones, the lower ones very small, all obtuse, mostly crenate, sometimes becoming green and glabrate above; head about 1′ broad; inner bracts of the involucre much broader than the outer, orbicular, or wider than long; achenes obovate, keeled on the inner face.

In dry soil, Kansas to Texas, Arizona and Mexico.

53. ENGELMÁNNIA T. & G. Fl. N. A. 2: 283. 1841.

Perennial hirsute herbs, with alternate pinnatifid leaves, and corymbose slender-peduncled rather large heads of both tubular and radiate yellow flowers. Involucre hemispheric, its bracts imbricated in 2 or 3 series, the outer linear, loose, hirsute, ciliate, the inner oval or obovate, concave, appressed, subtending the ray-flowers. Receptacle flat, chaffy, the chaff subtending and partly enclosing the disk-flowers. Rays 8–10, pistillate, fertile. Disk-flowers about as many, tubular, perfect, sterile, the corolla 5-toothed. Anthers minutely 2-dentate at the base. Style of the tubular flowers undivided. Achenes obovate, compressed, not winged, 1-ribbed on each face. Pappus a persistent irregularly cleft crown. [Named for Dr. Geo. Engelmann, botanist, of St. Louis.]

A monotypic genus of the south-central United States.

1. Engelmannia pinnatífida T. & G. Engelmannia. (Fig. 3874.)

Engelmannia pinnatifida T. & G. Fl. N. A. 2: 283. 1841.

Stem usually branched above, 1°–3° high. Basal leaves slender-petioled, 4′–8′ long, their lobes lanceolate or oblong, dentate or entire, obtuse or acutish; upper leaves smaller, sessile, less divided, the uppermost sometimes entire, or with a pair of basal lobes; heads usually numerous, about 1′ broad; peduncles 1′–5′ long; outer bracts of the involucre somewhat in 2 series, the first linear, the second broadened at the base.

In dry soil, Kansas to Louisiana, Arizona and North Mexico. May.–Aug.

54. PARTHÈNIUM L. Sp. Pl. 988. 1753.

Perennial, mostly pubescent or canescent herbs, or shrubs, with alternate leaves, and small corymbose or paniculate heads of both tubular and radiate white or yellow flowers. Involucre broadly campanulate or hemispheric, its bracts imbricated in 2 or 3 series, obtuse, appressed, nearly equal. Receptacle convex or conic, chaffy, the chaff membranous, surrounding the disk-flowers. Ray-flowers about 5, pistillate, fertile, their ligules short, broad, 2-toothed or obcordate. Disk-flowers perfect, sterile, their corollas 5-toothed, the style undivided. Anthers entire at the base. Achenes compressed, keeled on the inner face, margined, bearing the persistent rays on the summit. Pappus of 2–3 scales or awns. [Greek, virgin.]

About 10 species, natives of North America, Mexico, the West Indies and northern South America. ides the following, some 5 others occur in the southern and southwestern United States.

Stem minutely pubescent, or glabrous below; rootstocks thickened. 1. *P. integrifolium.*
Stem pilose-pubescent; rootstocks slender, creeping, forming runners. 2. *P. repens.*

1. Parthenium integrifòlium L. American Fever-few. Prairie Dock. (Fig. 3875.)

Parthenium integrifolium L. Sp. Pl. 988. 1753.

Stem stout, striate, finely pubescent with short hairs, or glabrous below, corymbosely branched above, 1°–4° high. Rootstocks tuberous-thickened; leaves firm, ovate or ovate-oblong, acute or acuminate, crenate dentate or somewhat lyrate at the base, hispidulous and roughish on both sides, the lower and basal ones petioled, often 12′ long and 5′ wide, the upper smaller, sessile and partly clasping; heads numerous in a dense terminal corymb; involucre nearly hemispheric, about 3″ high, its bracts firm, the outer oblong, densely appressed-pubescent, the inner broader, glabrous, or ciliate on the margins; rays white or whitish.

In dry soil, Maryland to Minnesota, south to Georgia, Missouri and Texas. Called also Cutting Almond. May–Sept.

2. Parthenium rèpens Eggert. Creeping or Hairy Parthenium. (Fig. 3876.)

Parthenium repens Eggert, Cat. Pl. St. Louis, 16. 1891.

Similar to the preceding species, but lower, seldom over 2° high. Rootstocks slender, forming runners; stem pilose or hispid with spreading hairs; leaves hispid on both sides, irregularly crenate, sometimes lyrate at the base, the teeth rounded and obtuse; heads fewer, slightly larger, in a smaller looser corymb; outer bracts of the involucre proportionately broader.

Missouri. April–July.

55. CRASSÌNA Scepin, Sched. Acido Veg. 42. 1758.

[ZINNIA L. Syst. Ed. 10, 1221. 1759.]

Annual or perennial herbs, some species shrubby, with opposite entire, or sparingly serrate, mostly narrow and sessile leaves, and large or middle-sized heads of both tubular and radiate flowers. Ray-flowers pistillate, yellow, or variegated, persistent on the achene. Disk-flowers perfect, fertile; corolla cylindraceous, its lobes villous. Involucre campanulate to nearly cylindric, its bracts obtuse, dry, firm, appressed, imbricated in 3 series or more, the outer gradually shorter. Receptacle conic or cylindric, chaffy, the chaff subtending and enwrapping the disk-flowers. Style branches elongated, not appendaged. Achenes of the ray-flowers somewhat 3-angled, those of the disk flattened. Pappus of few awns or teeth.

[In honor of Paul Crassus, an Italian botanist of the 16th century.]

About 12 species, natives of the United States and Mexico.

1. Crassina grandiflòra (Nutt.) Kuntze. Prairie Zinnia. (Fig. 3877.)

Zinnia grandiflora Nutt. Trans. Am. Phil. Soc. (II) 7: 348. 1841.

Crassina grandiflora Kuntze, Rev. Gen. Pl. 331. 1891.

Perenuial, woody at the base, tufted, much branched, rough, 4′–6′ high. Leaves rather rigid, linear to linear-lanceolate, entire, 6″–15″ long, 1½″ wide, or less, connate at the base, acute or acutish, crowded; heads numerous, peduncled, terminating the branches, 10″–18″ broad; rays 4 or 5, broad, yellow, rounded, or emarginate, their achenes with a pappus of 2 or 4 awns; involucre campanulate-cylindric, 3″–4″ high; style-branches of the disk-flowers subulate.

In dry soil, Kansas and Colorado to Texas, Mexico and Arizona. June–Sept.

56. HELIÓPSIS Pers. Syn. 2: 473. 1807.

Perennial herbs (a tropical species annual), with opposite petioled 3-ribbed leaves, and large peduncled terminal and axillary heads of tubular and radiate yellow flowers. Involucre hemispheric or broadly campanulate, its bracts oblong or lanceolate, imbricated in 2 or 3 series. Receptacle convex or conic, chaffy, the chaff enveloping the disk-flowers. Ray-flowers pistillate, fertile, the rays spreading, the tube very short, commonly persistent on the achene. Disk-flowers perfect, the tube short, the limb elongated, 5-toothed. Anthers entire, or minutely 2-toothed at the base. Style-branches tipped with small hirsute appendages. Achenes thick, obtusely 3–4-angled, the summit truncate. Pappus none, or of 2–4 teeth, or a coroniform border. [Greek, sun-like.]

About 6 species, natives of America. Besides the following, two others occur in the southern and southwestern United States.

Leaves smooth, or nearly so; pappus none, or of 2–4 stout teeth. 1. *H. helianthoides.*
Leaves rough; pappus crown-like, or of 1–3 sharp teeth. 2. *H. scabra.*

1. Heliopsis helianthòides (L.) B.S.P. Ox-eye. False Sunflower. (Fig. 3878.)

Buphthalmum helianthoides L. Sp. Pl. 904. 1753.

Heliopsis laevis Pers. Syn. 2: 473. 1807.

Heliopsis helianthoides B.S.P. Prel. Cat. N. Y. 28. 1888.

Stem glabrous, branched above, 3°–5° high. Leaves opposite, or rarely in 3's, ovate or ovate-lanceolate, rather thin, acuminate at the apex, usually abruptly narrowed at the base, sharply and nearly equally dentate, smooth on both sides, or roughish above, 3′–6′ long, 1′–2½′ wide; heads long-peduncled, somewhat corymbose, 1½′–2½′ broad; rays 9″–12″ long, persistent, or at length decaying away from the achenes; bracts of the involucre oblong or linear-oblong, obtuse or acutish, the outer commonly longer than the inner; achenes glabrous, the summit truncate; pappus none, or of 2–4 short teeth.

In open places, Ontario to Florida, west to Illinois and Kentucky. July–Sept.

2. Heliopsis scàbra Dunal. Rough Ox-eye. (Fig. 3879.)

Heliopsis scabra Dunal, Mem. Mus. Paris, 5: 56. *pl. 4.* 1819.
Heliopsis laevis var. *scabra* T. & G. Fl. N. A. 2: 303. 1842.

Similar to the preceding species, but stem rough, at least above, simple or branched, 2°–4° high. Leaves ovate or ovate-lanceolate, acute or sometimes acuminate, sharply dentate, rough on both sides, firm, 2′–5′ long, 1½′–2′ wide, abruptly narrowed at the base, short-petioled; heads few, or sometimes solitary, long-peduncled, 2′–2½′ broad; rays usually 1′ long, or more; bracts of the involucre canescent, oblong or linear-oblong; achenes pubescent on the margins when young; pappus a short laciniate crown, or 1–3 sharp teeth.

Usually in dry soil, Maine to New York, New Jersey, Illinois, British Columbia, and Arkansas. June–Sept.

57. ECLÍPTA L. Mant. Pl. 2: 157. 1771.

Erect or diffuse branching pubescent or hirsute herbs, with opposite leaves, and small peduncled terminal and axillary heads of tubular and radiate whitish flowers. Involucre hemispheric or broadly campanulate, its bracts imbricated in about 2 series, nearly equal, or the outer longer. Receptacle flat or convex, chaffy, the chaff awn-like, subtending the achenes. Ray-flowers pistillate, fertile. Disk-flowers perfect, mostly fertile, their corollas tubular, 4-toothed or rarely 5-toothed. Anthers entire or minutely 2-toothed at the base. Style-branches of the disk-flowers with obtuse or triangular tips. Achenes thick, those of the rays 3-sided, those of the disk compressed. Pappus none, or of a few short teeth. [Greek, wanting, referring to the absence of pappus.]

About 4 species, mostly of tropical distribution.

1. Eclipta álba (L.) Hassk. Eclipta. (Fig. 3880.)

Verbesina alba L. Sp. Pl. 902. 1753.
Eclipta erecta L. Mant. 2: 286. 1771.
Eclipta procumbens Michx. Fl. Bor. Am. 2: 129. 1803.
Eclipta alba Hassk. Pl. Jav. Rar. 528. 1848.

Annual, rough with appressed pubescence, erect or diffuse, 6′–3° high. Leaves lanceolate, oblong-lanceolate or linear-lanceolate, acute or acuminate, denticulate or entire, narrowed to a sessile base, or the lower petioled, 1′–5′ long, 2″–10″ wide; heads commonly numerous, 3″–6″ broad, nearly sessile, or slender-peduncled; rays short, nearly white; anthers brown; achenes 4-toothed, or at length truncate.

Along streams, and in waste places, southern New York to Illinois and Nebraska, south to Florida, Texas and Mexico. Naturalized from tropical America and widely distributed in warm regions as a weed. July–Oct.

58. TETRAGONOTHÈCA L. Sp. Pl. 903. 1753.

Erect perennial mostly branched herbs, with opposite, sessile or connate-perfoliate, broad dentate leaves, and large peduncled heads of tubular and radiate yellow flowers. Involucre depressed-hemispheric, its principal bracts 4, large and foliaceous, inserted in 1 series; inner bracts 6–15, small, subtending the pistillate ray-flowers. Receptacle conic, chaffy, the chaff concave, enwrapping the perfect fertile disk-flowers, the corollas of which are slender and 5-toothed. Anthers entire or minutely 2-toothed at the base. Style-branches of the disk-flowers hispid, tipped with elongated appendages. Achenes thick, 4-sided, truncate at the summit. Pappus none, or of several short scales. [Greek, 4-angled-case, referring to the involucre.]

Three known species, natives of the southern United States and northern Mexico.

1. Tetragonotheca helianthoides L. Tetragonotheca. (Fig. 3881.)

Tetragonotheca helianthoides L. Sp. Pl. 903. 1753.

Viscidly pubescent; stem branched or simple, 1°–2½° high. Leaves ovate, ovate-oblong, or somewhat rhomboid, thin, coarsely and unequally dentate, pinnately veined, acute at the apex, narrowed at the base, sessile, or connate-perfoliate, 2′–6′ long, 1′–3′ wide; heads usually few, 1½′–3′ broad; involucre 4-angled in the bud, its principal bracts broadly ovate, acute; rays 6–10, strongly parallel-nerved, 2–3-toothed; corolla-tube villous below; achenes 4-sided, or nearly terete; pappus none.

In dry soil, Virginia to Florida and Alabama. May–June. Sometimes flowering again in the autumn.

59. SPILÁNTHES Jacq. Stirp. Am. 214. *pl. 126.* 1763.

Annual branching herbs, or some species perennial, with opposite, usually toothed leaves and rather small, long-peduncled discoid and radiate heads, terminal, or in the upper axils, or rays wanting in some species. Involucre campanulate, its bracts in about 2 series, herbaceous, loosely appressed. Receptacle convex or elongated, chaffy, its chaff embracing the disk-achenes and at length falling away with them. Ray-flowers yellow, or white, pistillate. Disk-flowers yellow, perfect, their corollas tubular with an expanded 4–5-cleft limb. Anthers truncate at the base. Style-branches of the disk-flowers long, sometimes penicillate at the summit. Ray-achenes 3-sided, or compressed, those of the disk-flowers compressed, margined. Pappus of 1–3 awns, or more. [Greek, spot- or stain-flower, not significant.]

About 30 species, natives of warm and tropical regions.

1. Spilanthes rèpens (Walt.) Michx. Spilanthes. (Fig. 3882.)

Anthemis repens Walt. Fl. Car. 211. 1788.
Spilanthes repens Michx. Fl. Bor. Am. 2: 131. 1803.

Perennial, usually rooting at the lower nodes; stem slender, simple or branched, spreading or ascending, 8′–2° long, pubescent, or nearly glabrous. Leaves ovate to lanceolate, petioled, acute or acuminate at the apex, or the lower obtuse, coarsely toothed, or nearly entire, 1′–3′ long; heads long-peduncled, solitary at the end of the stem and branches, 6″–10″ broad; bracts of the involucre oblong to oblong-lanceolate, obtuse or acute; rays 8–12, yellow; receptacle narrowly conic; achenes oblong, most of them roughened when mature and hispidulous; pappus of 1 or 2 very short awns, or none.

In moist or wet soil, Missouri to Texas, east to South Carolina and Florida. June–Sept.

60. RUDBÉCKIA L. Sp. Pl. 906. 1753.

Perennial or biennial (rarely annual), mostly rigid, usually rough or hispid herbs, with alternate undivided lobed or pinnatifid leaves, and large long-peduncled heads of tubular (mostly purple) and radiate (yellow) flowers. Involucre hemispheric, its bracts imbricated

in 2–4 series. Receptacle conic or convex, with chaffy concave scales subtending or enveloping the disk-flowers. Ray-flowers neutral, the rays entire or toothed. Disk-flowers perfect, fertile, their corollas 5-lobed. Authers entire or minutely 2-mucronate at the base. Style-branches tipped with hirsute appendages. Achenes 4-angled, obtuse or truncate at the apex. Pappus coroniform, sometimes of 2–4 short teeth, or none. [In honor of Claus Rudbeck, 1630–1702, Swedish anatomist and botanist.]

About 27 species, natives of North America and Mexico. In addition to the following, some 18 others occur in the southern and western United States.

* Stem-leaves not cordate-clasping; achenes 4-angled.

Disk globose or ovoid and purple or dark brown in fruit; lower leaves entire or lobed.
Lower leaves deeply 3-lobed or 3-divided.
Plant more or less hirsute; leaves thin; chaff awned. 1. *R. triloba.*
Plant scabrous; leaves thick; chaff blunt, pubescent at apex. 2. *R. subtomentosa.*
Leaves neither 3-lobed nor 3-divided.
Plants hispid; chaff acute or acutish, hirsute at summit.
Stem leaves lanceolate to oblong; involucre shorter than the rays. 3. *R. hirta.*
Stem leaves oval to obovate; involucral bracts foliaceous, nearly as long as the rays. 4. *R. Brittonii.*
Plants pubescent or glabrate; chaff obtuse.
Leaves denticulate or entire; rays 9″–12″ long.
Stem leaves oblong or oblong-lanceolate; disk 6″–8″ broad, globose. 5. *R. fulgida.*
Stem leaves obovate or spatulate; disk 4″–5″ broad, depressed. 6. *R. spathulata.*
Leaves dentate or laciniate; rays about 18″ long. 7. *R. speciosa.*
Disk elongated or cylindric in fruit, yellowish or gray; lower leaves pinnately divided or pinnatifid. 8. *R. laciniata.*

* * Stem-leaves cordate-clasping; achenes nearly terete, striate. 9. *R. amplexicaulis.*

1. Rudbeckia tríloba L. Thin-leaved Cone-flower. (Fig. 3883.)

Rudbeckia triloba L. Sp. Pl. 907. 1753.

Stem somewhat pubescent and rough, rarely glabrate, branched, 2°–5° high. Leaves thin, rough on both sides, bright green, the basal and lower ones petioled, some or all of them 3-lobed or 3-parted, the lobes lanceolate or oblong, acuminate, sharply serrate; upper leaves ovate, ovate-lanceolate, or lanceolate, acuminate or acute, narrowed to a sessile base or into short margined petioles, serrate or entire, 2′–4′ long, ½′–1′ wide; heads nearly 2′ broad, corymbed; bracts of the involucre linear, acute; pubescent, soon reflexed; rays 8–12, yellow, or the base orange or brownish-purple; disk dark purple, ovoid, about 6″ broad; chaff of the receptacle awn-pointed; pappus a minute crown.

In moist soil, New Jersey to Georgia, west to Michigan, Missouri and Louisiana. Sometimes escaped from gardens to roadsides. Called also Brown-eyed Susan. June–Oct.

2. Rudbeckia subtomentòsa Pursh. Sweet Cone-flower. (Fig. 3884.)

Rudbeckia subtomentosa Pursh, Fl. Am. Sept. 575. 1814.

Densely and finely cinereous-pubescent and scabrous; stem branched above, 2°–6° high. Leaves thick, some or all the lower ones deeply 3-lobed or 3-parted, petioled, 3′–5′ long, the lobes oblong or lanceolate, acute or acuminate, dentate; upper leaves, or some of them, lanceolate or ovate, acuminate, sessile or nearly so; heads numerous, 2′–3′ broad; rays 15–20, yellow, or with a darker base; disc subglobose, rounded, purple, 6″–8″ broad; bracts of the involucre linear-lanceolate, acuminate, squarrose, sweet-scented; chaff of the receptacle linear, obtuse or obtusish, pubescent, or somewhat glandular at the apex; pappus a short crenate crown.

On prairies and along rivers, Illinois to Louisiana, Missouri and Texas. July–Sept.

3. **Rudbeckia hírta** L. Black Eyed Susan. Yellow Daisy. (Fig. 3885.)

Rudbeckia hirta L. Sp. Pl. 907. 1753.

Hirsute or hispid throughout, biennial or sometimes annual; stems simple or sparingly branched, often tufted, 1°–3° high. Leaves thick, sparingly serrate with low teeth, or entire, lanceolate or oblong, the lower and basal ones petioled, mostly obtuse, 3–5-nerved, 2′–7′ long, ½′–2′ wide, the upper sessile, narrower, acute or acutish; heads commonly few or solitary, 2′–4′ broad; rays 10–20, orange, rarely darker at the base; bracts of the involucre very hirsute, spreading or reflexed, much shorter than the rays; disk globose-ovoid, purple-brown; chaff of the receptacle linear, acute or acutish, hirsute at the apex; style-tips acute; pappus none.

In fields, Quebec to western Ontario and the Northwest Territory, south to Florida, Colorado and Texas. Native only on the western prairies. Widely distributed in the east as a weed. Called also Nigger-head, Golden Jerusalem, Ox-eye Daisy. May–Sept.

4. **Rudbeckia Brittònii** Small. Britton's Cone-flower. (Fig. 3886.)

Rudbeckia Brittonii Small, Mem. Torr. Club, 4: 130. 1894.

Stem stout, hispid, erect, 1½°–2½° high, simple, grooved, leafy, at least below. Leaves serrate or crenate-serrate, strigose-pubescent, the basal ones ovate to ovate-lanceolate, 3′–4′ long, obtuse, long-petioled; stem leaves obovate to oval, often with a lateral lobe, the petioles wing-margined; uppermost leaves often ovate-lanceolate, sessile, cordate; bracts of the involucre foliaceous, often 1′ long or more; head 2′–3′ broad; rays about 12, 2-lobed; outer chaff oblanceolate, the inner linear, acute, purple-tipped, fringed with jointed hairs; style-tips slender, acute.

In woods, mountains of Pennsylvania to Virginia and Tennessee. May–July.

5. **Rudbeckia fúlgida** Ait. Orange Cone-flower. (Fig. 3887.)

Rudbeckia fulgida Ait. Hort. Kew. 3: 251. 1789.

Perennial; stem hirsute, or strigose-pubescent, slender, sparingly branched or simple, 1°–3° high. Leaves firm, entire, or sparingly serrate with distant teeth, more or less hirsute or pubescent on both sides, the basal and lower ones oblong or spatulate, obtuse, 2′–4′ long, 3-nerved, narrowed into margined petioles, the upper lanceolate or oblong-lanceolate, sessile, or slightly clasping at the base; heads few, 1′–1½′ broad; bracts of the involucre oblong or lanceolate, 3″–8″ long; rays 10–15, linear, bright yellow, or with an orange base; disk globose or globose-ovoid, brown-purple, 5″–7″ broad; chaff of the receptacle linear-oblong, obtuse, glabrous, or nearly so at the summit; pappus a minute crown.

In dry soil, New Jersey and Pennsylvania to Georgia, west to Missouri and Texas. Aug.–Oct.

6. Rudbeckia spathulàta Michx. Spatulate-leaved, or Flat-headed Cone-flower. (Fig. 3888.)

Rudbeckia spathulata Michx. Fl. Bor. Am. 2: 144. 1803.

Perennial; stem slender, simple, or little branched, finely strigose-pubescent, 1°–3° high. Leaves appressed-pubescent on both sides, obovate, oval, or spatulate, the lower 2′–4′ long, 1′–1½′ wide, or the basal ones sometimes nearly orbicular, obtuse or obtusish, denticulate, narrowed into margined petioles; upper leaves smaller, sessile, mostly entire, oblong and acute; heads few, or solitary, 1′–1½′ broad; bracts of the involucre short, at length reflexed; disk depressed-globose or ovoid, about 5″ broad; rays 8–12, oblong, yellow, mostly orange at the base; chaff of the receptacle obtuse; style-tips obtuse; pappus a short-toothed crown.

In dry woods, Chester Co., Penn., to Tennessee and Florida. Aug.–Sept.

7. Rudbeckia speciòsa Wenderoth. Showy Cone-flower. (Fig. 3889.)

Rudbeckia aspera Pers. Syn. 2: 477. 1807.?
Rudbeckia speciosa Wender. Ind. Sem. Hort. Marb. 1828.

Perennial, more or less hirsute or hispid; stem branched above, 1°–4° high. Leaves firm, slender-petioled, 2′–5′ long, 1′–2′ wide, dentate with low teeth, acute or sometimes acuminate, 3–5-nerved; stem leaves sessile or partly clasping, or narrowed into broad margined petioles, laciniate or sharply serrate, lanceolate, acuminate, often 6′ long, the uppermost smaller and sometimes entire; heads several, 2′–3′ broad; bracts of the involucre linear-lanceolate, acute; rays 12–20, 1′–1½′ long, bright yellow, usually orange at the base; disk depressed-globose, 5″–8″ broad, brown-purple; chaff of the receptacle obtusish or acute, ciliate or naked; pappus a short crown.

In moist soil, New Jersey to Michigan, south to Alabama and Arkansas. Aug.–Oct.

8. Rudbeckia laciniàta L. Tall, or Green-headed Cone-flower. (Fig. 3890.)

Rudbeckia laciniata L. Sp. Pl. 906. 1753.

Perennial; stem much branched, glabrous, or nearly so, 3°–12° high. Leaves rather thin, minutely pubescent on the margins and upper surface, broad, the basal and lower ones long-petioled, often 1° wide, pinnately 3–7-divided, the segments variously toothed and lobed; stem leaves shorter-petioled, 3–5-parted or divided, the uppermost much smaller, 3-lobed, dentate or entire; heads several or numerous, 2½′–4′ broad; rays 6–10, bright yellow, drooping; bracts of the involucre unequal; chaff of the receptacle truncate and canescent at the apex; disk greenish-yellow, at length oblong and twice as long as thick or longer; pappus a short crown.

In moist thickets, Quebec to Manitoba and Montana, south to Florida and New Mexico. Called also Thimble weed. July–Sept.

Rudbeckia laciniàta hùmilis A. Gray, Syn. Fl. 1: Part 2, 262. 1884.

Simple or branched, glabrous or nearly so, 1°–2° high, some or all of the basal leaves orbicular and undivided; heads 1½′–2½′ broad; disk globose or ovoid. Virginia and North Carolina to Tennessee and Georgia, mostly in the mountains.

9. Rudbeckia amplexicaùlis Vahl. Clasping-leaved Cone-flower. (Fig. 3891.)

Rudbeckia amplexicaulis Vahl. Act. Havn. 2: 29. *pl. 4.* 1783.

Annual; glabrous throughout, somewhat glaucous; stem branched, grooved, 1°–2° high, the branches ascending. Leaves entire, or sparingly toothed, 1-ribbed, reticulate-veined, the lower oblong to spatulate, sessile, the upper ovate, ovate-oblong, or lanceolate, acute, cordate-clasping; heads solitary at the ends of the branches, long-peduncled, about 2′ broad; bracts of the involucre few, lanceolate, acuminate; rays yellow, or sometimes brown at the base; disk ovoid-oblong, often becoming 1′ high; achenes not angled, striate and transversely wrinkled, obliquely attached to the elongated receptacle; chaff at length deciduous; pappus none.

In wet soil, Missouri to Louisiana and Texas. June–Aug.

61. RATÍBIDA Raf. Am. Month. Mag. 2: 268. 1818.

[Lepachys Raf. Journ. Phys. 89: 100. 1819.]

Mostly perennial herbs, with alternate pinnately divided or parted leaves, and long-peduncled terminal heads of tubular and radiate flowers, the disk-flowers gray or yellow, becoming brown, the rays yellow, or with brown bases, drooping or spreading. Involucral bracts in 2 or 3 series. Disk globose, oblong or cylindric. Receptacle columnar to subulate, the concave chaff subtending or enveloping the disk-flowers, truncate, the tips inflexed, canescent. Ray-flowers neutral. Disk-flowers perfect, fertile, their corollas with scarcely any tube. Achenes short, flattened, sharp-margined, or winged, at length deciduous with the chaff. Pappus with 1 or 2 teeth, or none. [Name unexplained.]

About 4 species, natives of North America.

Style-tips lanceolate-subulate; leaf-segments lanceolate; rays 1′–3′ long, 1. *R. pinnata.*
Style-tips short, blunt; leaf-segments linear; rays 3″–15″ long.
  Disk cylindric, at length 1′ long or more; rays mostly as long, or longer. 2. *R. columnaris.*
  Disk globose to short-oblong, about ½′ high; rays mostly short. 3. *R. Tagetes.*

1. Ratibida pinnàta (Vent.) Barnhart. Gray-headed Cone-flower. (Fig. 3892.)

Rudbeckia pinnata Vent. Hort. Cels, *pl. 71.* 1800.
Lepachys pinnata T. & G. Fl. N. A. 2: 314. 1842.
Ratibida pinnata Barnhart, Bull. Torr. Club, 24: 410. 1897.

Perennial; rough and strigose-pubescent throughout; stem branched or simple, 3°–5° high. Leaves pinnately 3–7-divided, the basal ones sometimes 10′ long, petioled, the segments lanceolate-dentate, cleft or entire, acute or acuminate; upper leaves sessile or nearly so, the uppermost commonly small and entire; bracts of the involucre linear or linear-oblong, short, reflexed; rays 4–10, bright yellow, 1′–3′ long, 3″–9″ wide, drooping; style-tips lance-subulate; disk oblong, gray or becoming brown, rounded, at length twice as long as thick; chaff of the receptacle canescent at the summit; achenes compressed, acutely margined, the inner margin produced into a short tooth.

On dry prairies, Western New York to Florida, west to Minnesota, Nebraska and Louisiana. June–Sept.

2. Ratibida columnàris (Sims) D. Don. Long-headed or Prairie Cone-flower. (Fig. 3893.)

Rudbeckia columnaris Sims, Bot. Mag. *pl. 1601.* 1813.
Ratibida columnaris D. Don; Sweet, Brit. Fl. Gard. 2: 361. 1838.
Lepachys columnaris T. & G. Fl. N. A. 2: 313. 1842.
Lepachys columnaris var. *pulcherrima* T. & G. loc. cit. 1842.

Perennial, strigose-pubescent and scabrous; stem slender, usually branched, 1°–2½° high. Leaves thick, pinnately divided into linear or linear-oblong, acute or obtuse, entire dentate or cleft segments, the cauline short-petioled or sessile, 2′–4′ long, the basal ones sometimes oblong, obtuse and undivided, slender-petioled; bracts of the involucre short, linear-lanceolate or subulate, reflexed; rays 4–10, yellow, brown at the base, or brown all over, 4″–15″ long, drooping; disk gray, elongated-conic or cylindric, obtuse, at length 3 or 4 times as long as thick; chaff of the receptacle canescent at the apex; achenes scarious-margined or narrowly winged on the inner side; pappus of 1 or 2 subulate teeth usually with several short intermediate scales.

On dry prairies, Northwest Territory to Minnesota, Nebraska, Texas and Arizona. Also in Tennessee. May–Aug.

3. Ratibida Tagètes (James) Barnhart. Short-rayed Cone-flower. (Fig. 3894.)

Rudbeckia Tagetes James in Long's Exp. 2: 68. 1823.
Lepachys Tagetes A. Gray, Pac. R. R. Rep. 4: 103. 1856.
Ratibida Tagetes Barnhart, Bull. Torr. Club, 24: 100. 1897.

Perennial, rough-canescent; stem 1°–1½° high, usually much branched, leafy. Leaves firm, pinnately divided into 3–7 narrowly linear, mostly entire segments; peduncles terminal, ½′–2′ long; heads 1′ broad, or less; bracts of the receptacle narrow, deflexed; rays few, mostly shorter than the globose to short-oval disk; style-tips obtuse; achenes scarious-margined; pappus of 1 or 2 subulate deciduous teeth, with no short intermediate teeth.

On dry plains and rocky hills, Kansas to Texas, Chihuahua, New Mexico and Arizona. July–Sept.

62. BRAUNÈRIA Neck. Elem. 1: 17. 1790.

[ECHINACEA Moench, Meth. 591. 1794.]

Perennial erect branched or simple herbs, with thick black roots, thick rough alternate or opposite 3–5-nerved entire or dentate undivided leaves, and large long-peduncled heads of tubular and radiate flowers, the rays purple, purplish or crimson, the disk green or purple, at length ovoid or conic. Involucre depressed-hemispheric, its bracts lanceolate, spreading or appressed, imbricated in 2–4 series. Receptacle conic, chaffy, the chaff carinate and cuspidate. Ray-flowers neutral, or with a rudimentary pistil. Disk-flowers perfect, the corolla cylindric, 5-toothed. Achenes 4-sided, obpyramidal, thick. Pappus a short dentate crown. [Named for Jacob Brauner, a German botanist of the 18th century.]

Two known species, natives of eastern and central North America.

Leaves ovate or ovate-lanceolate, mostly dentate. 1. *B. purpurea.*
Leaves lanceolate or oblong-lanceolate, entire. 2. *B. pallida.*

1. Brauneria purpùrea (L.) Britton. Purple Cone-flower. Black Sampson. (Fig. 3895.)

Rudbeckia purpurea L. Sp. Pl. 907. 1753.
Echinacea purpurea Moench, Meth. 591. 1794.
Brauneria purpurea Britton, Mem. Torr. Club, 5: 334. 1894.

Stem glabrous, or sparingly hispid, usually stout, 2°–5° high. Lower and basal leaves slender-petioled, ovate, mostly 5-nerved, acute or acuminate at the apex, abruptly narrowed or rarely cordate at the base, commonly sharply dentate, 3′–8′ long, 1′–3′ wide; petioles mostly winged at the summit; uppermost leaves lanceolate or ovate-lanceolate, 3-nerved, sessile or nearly so, often entire; rays 12–20, purple, crimson, or rarely pale, 1½′–3′ long, spreading or drooping.

In moist, rich soil, Virginia to Alabama, west to Illinois, Kentucky and Louisiana. Called also Red Sunflower. July–Oct.

2. Brauneria pállida (Nutt.) Britton. Pale Purple Cone-flower. (Fig. 3896.)

Rudbeckia pallida Nutt. Journ. Acad. Phila. 7: 77. 1834.
Echinacea angustifolia DC. Prodr. 5: 554. 1836.
Brauneria pallida Britton, Mem. Torr. Club, 5: 333. 1894.

Stem hispid, slender, often simple, 1°–3° high. Leaves lanceolate, oblong-lanceolate, or linear-lanceolate, acute and about equally narrowed at each end, strongly 3-nerved and sometimes with an additional pair of marginal less distinct nerves, entire, 3′–8′ long, 4″–12″ wide, the lower and basal ones slender-petioled, the upper short-petioled or sessile; heads and flowers similar to those of the preceding species, but the rays usually shorter and narrower, often pale.

In dry soil, especially on prairies, Illinois to Alabama, west to Minnesota, the Northwest Territory, Nebraska and Texas. July–Oct.

63. BORRÍCHIA Adans. Fam. Pl. 2: 130. 1763.

Fleshy, more or less canescent, branching shrubs of the sea-coast, with opposite entire or denticulate, cuneate oblong spatulate or obovate, 1–3-nerved leaves, and terminal large long-peduncled heads of both tubular and radiate yellow flowers. Involucre hemispheric, its bracts slightly unequal, imbricated in 2 or 3 series, the inner ones coriaceous. Receptacle convex, chaffy, the chaff rigid, concave, subtending or enwrapping the disk-flowers. Ray-flowers pistillate, fertile. Disk-flowers perfect, the corolla tubular, 5-toothed, the style-branches elongated, hispid. Anthers dark-colored, entire at the base, or minutely sagittate. Achenes of the ray-flowers 3-sided, those of the disk-flowers 4-sided. Pappus a short dentate crown. [Named for Olaf Borrick, a Danish botanist.]

About 5 species, natives of America. In addition to the following, another occurs in South Florida.

1. Borrichia frutéscens (L.) DC. Sea Ox-eye. (Fig. 3897.)

Buphthalmum frutescens L. Sp. Pl. 903. 1753.
Borrichia frutescens DC. Prodr. 5: 488. 1836.

Finely canescent, even when old; stems terete, sparingly branched, 1°–4° high. Leaves mostly erect or ascending, spatulate or obovate, obtuse or acutish and mucronulate at the apex, fleshy, tapering to the sessile base, somewhat connate, 1′–3′ long, 2″–7″ wide; heads solitary or few, about 1′ broad; rays 15–25, rather short; exterior bracts of the involucre ovate and somewhat spreading, the inner ones and the chaff of the receptacle cuspidate.

Sea-coast, Virginia to Florida and Texas. Also on the coasts of Mexico and the West Indies. April–Oct.

64. HELIÁNTHUS L. Sp. Pl. 904. 1753.

Erect, annual or perennial, mostly branched herbs, with opposite or alternate, simple leaves, and large peduncled corymbose or solitary heads of both tubular and radiate flowers, the rays yellow, the disk yellow, brown, or purple. Involucre hemispheric, or depressed, its bracts imbricated in several series. Receptacle flat, convex or conic, chaffy, the chaff subtending the disk-flowers. Ray-flowers neutral (in our species), the rays spreading, mostly entire. Disk-flowers perfect, fertile, the corolla tubular, the tube short, the limb 5-lobed. Anthers entire, or minutely 2-toothed at the base. Style-branches tipped with hirsute appendages. Achenes thick, oblong or obovate, compressed, or somewhat 4-angled. Pappus of 2 scales or awns, or sometimes with 2–4 additional shorter ones, deciduous. [Greek, sunflower.]

About 60 species, natives of the New World. Besides the following, about 18 others occur in the southern and western parts of North America.

* Disk purple, purplish or brown; receptacle flat or convex.

1. Leaves mostly alternate, the lower opposite.

Leaves narrow, linear or lanceolate; perennials.
- Stem rough; leaves linear or linear-lanceolate; eastern. — 1. *H. angustifolius.*
- Stem glabrous; leaves elongated-linear; western. — 2. *H. orgyalis.*

Leaves broad, ovate; annuals.
- Leaves dentate; bracts ovate, acuminate, ciliate, hispid. — 3. *H. annuus.*
- Leaves entire or nearly so; bracts lanceolate, canescent. — 4. *H. petiolaris.*

2. Leaves mostly opposite, the upper alternate.
- Leaves hispid, abruptly contracted into winged petioles. — 5. *H. atrorubens.*
- Leaves gradually narrowed into petioles. — 6. *H. scaberrimus.*

* * Disk yellow or yellowish; receptacle convex or conic.

† *Leaves nearly all basal or near the base; upper bract-like.*
- 7. *H. occidentalis.*

†† *Stems leafy; leaves alternate or opposite.*

1. Leaves prevailingly lanceolate and 3–8 times as long as wide.

a. Leaves glabrous on both sides; heads 1′–1½′ broad. — 8. *H. laevigatus.*

b. Leaves scabrous, at least on the upper surface.
- Heads ½′–1½′ broad; leaves thin; stem glabrous. — 9. *H. microcephalus.*
- Heads 1½′–3½′ broad; leaves firm, many of them often alternate.
  - Stem scabrous, scabrate or hispid; leaves sessile or nearly so.
    - Leaves lanceolate, scabrous above, hirsute beneath. — 10. *H. giganteus.*
    - Leaves elongated-lanceolate, very scabrous on both sides. — 11. *H. Maximiliani.*
  - Stem glabrous; leaves sessile by a truncate base. — 13. *H. divaricatus.*
  - Stem glabrous, glaucous; leaves petioled. — 12. *H. grosse-serratus.*

2. Leaves prevailingly ovate, ovate-lanceolate, or oblong.

a. Leaves sessile, or very nearly so.
- Stem glabrous; leaves divaricate. — 13. *H. divaricatus.*
- Stem hirsute or hispid; leaves ascending.
  - Leaves cordate-clasping at the base. — 14. *H. mollis.*
  - Leaves narrowed from below the middle. — 15. *H. doronicoides.*

b. Leaves manifestly petioled.
- Stem puberulent or glabrous.
  - Leaves membranous, slender-petioled, sharply serrate. — 16. *H. decapetalus.*
  - Leaves firmer, shorter-petioled, less serrate or entire.
    - Bracts of the involucre much longer than the disk. — 17. *H. tracheliifolius.*
    - Bracts of the involucre about equalling the disk. — 18. *H. strumosus.*
- Stem hirsute, hispid, or scabrous.
  - Leaves rounded or truncate at the base, short-petioled. — 19. *H. hirsutus.*
  - Leaves, at least the upper, narrowed at the base
    - Bracts of the involucre ovate-lanceolate, appressed. — 20. *H. laetiflorus.*

Bracts of the involucre lanceolate-acuminate, spreading.
Leaves villous-pubescent beneath. 21. *H. tomentosus.*
Leaves scabrous or puberulent beneath. 22. *H. tuberosus.*

1. Helianthus angustifòlius L. Narrow-leaved or Swamp Sunflower. (Fig. 3898.)

Helianthus angustifolius L. Sp. Pl. 906. 1753.

Perennial by slender rootstocks; stems branched above, or simple, slender, rough or roughish above, often hirsute below, 2°–7° high. Leaves firm, entire, sessile, linear, slightly scabrous, rarely somewhat canescent beneath, 2′–7′ long, 2″–3″ wide, the margins revolute when dry, the upper ones all alternate, the lower opposite; heads usually few, sometimes solitary, 2′–3′ broad; involucre hemispheric, its bracts linear-lanceolate, acute or acuminate, scarcely squarrose, pubescent; receptacle slightly convex; disk purple; chaff entire or 3-toothed; rays 12–20; achenes truncate, glabrous; pappus usually of 2 short awns.

In swamps, Long Island, N. Y. to Florida, Kentucky and Texas, mainly near the coast. Aug.–Oct.

2. Helianthus orgyàlis DC. Linear-leaved Sunflower. (Fig. 3899.)

H. giganteus var. *crinitus* Nutt. Gen. 2: 177. 1818.?
Helianthus orgyalis DC. Prodr. 5: 586. 1836.

Perennial by slender rootstocks; stems glabrous, branched near the summit, very leafy to the top, 6°–10° high. Leaves sessile, entire, linear or nearly filiform, or the lowest lanceolate, remotely dentate and short-petioled, rough with mucronate-tipped papillae, especially on the lower surface, acuminate, 4′–16′ long, 1″–4″ wide, the upper all alternate and 1-nerved, the lower commonly opposite; heads numerous, about 2′ broad, terminating slender branches; involucre nearly hemispheric, its bracts linear-subulate to lanceolate, acuminate, squarrose, ciliate; disk purple or brown; receptacle convex, its chaff entire, or toothed, slightly ciliate; rays 10–20; achenes oblong-obovate, glabrous, 2½″–3″ long, 2–4-awned.

On dry plains, Nebraska and Colorado to Texas. Cultivated. Sept.–Oct.

3. Helianthus ánnuus L. Common Sunflower. (Fig. 3900.)

Helianthus annuus L. Sp. Pl. 904. 1753.

Stem hispid or scabrous, stout, branched above, 3°–6° high, or in cultivated forms sometimes 15° high. Leaves all but the lower alternate, broadly ovate, petioled, 3-nerved, dentate or denticulate, acute at the apex, rough on both sides, sometimes pubescent beneath, the lower cordate at the base, 3′–12′ long; heads in the wild plant 3′–6′ broad; disk dark purple or brown; involucre depressed, its bracts ovate or oblong, usually long-acuminate or aristate, hispid-ciliate; chaff of the receptacle 3-cleft; achenes obovate-oblong, appressed-pubescent, or nearly glabrous.

On prairies, etc., Minnesota to the Northwest Territory, Missouri and Texas. Much larger in cultivation; an occasional escape in the east. Old names, Gold, Gloden, Lareabell. Its flowers yield honey and a yellow dye; its leaves fodder; its seeds, an oil and food; and its stalks a textile fibre. July–Sept.

4. Helianthus petiolàris Nutt. Prairie Sunflower. (Fig. 3901.)

H. petiolaris Nutt. Journ. Acad. Phila. 2: 115. 1821.

Annual, similar to the preceding species, but smaller and with smaller heads; stem strigose-hispid or hirsute, 1°–3° high. Leaves all but the lowest alternate, petioled, oblong, ovate, or ovate-lanceolate, rough on both sides, usually paler beneath than above, 1′–3′ long, entire, or denticulate, obtuse or acutish at the apex, mostly narrowed at the base; heads 1½′–3′ broad; disk brown; involucre depressed-hemispheric, its bracts lanceolate or oblong-lanceolate, densely canescent, not hispid-ciliate, acute or short-acuminate; achenes villous pubescent, at least when young.

On dry prairies, Minnesota to the Northwest Territory, and Oregon, south to Missouri, Texas and Arizona. Found rarely in waste places farther east. June–Sept.

Helianthus petiolàris cànus Britton, Mem. Torr. Club, 5: 334. 1894.

H. petiolaris var. *canescens* A. Gray, Pl. Wright. 1: 108. 1852. Not *H. canescens* Michx. 1803.

Leaves ovate, white-canescent beneath. Nebraska to Texas and New Mexico.

Helianthus petiolàris pàtens (Lehm.) Rydberg, Mem. Torr. Club, 5: 334. 1894.

Helianthus patens Lehm. Ind. Sem. Hamburg. 1828.

Heads larger, long-peduncled, the peduncles fleshy toward the top; leaves large, long-petioled. Nebraska.

5. Helianthus atrórubens L. Hairy Wood Sunflower. Purple-disk Sunflower. (Fig. 3902.)

Helianthus atrorubens L. Sp. Pl. 906. 1753.

Perennial; stems hirsute below, often minutely pubescent above, branched at the summit, 2°–5° high. Leaves hirsute on both sides, or canescent beneath, mostly thin, ovate or ovate-lanceolate, acutish, contracted near the base into margined petioles, dentate or crenate-dentate, 4′–10′ long, 1′–4′ wide, the lower opposite, the upper few, distant, small, mainly alternate; heads not numerous, slender-peduncled, about 2′ broad; involucre hemispheric, its bracts oblong to obovate, obtuse, ciliolate, appressed; disk purple; receptacle convex, its chaff acute, entire, or 3-toothed; rays 10–20; achenes obovate, truncate, finely pubescent, about 2″ long; pappus usually of 2 lanceolate awns.

In dry woods, Virginia to Florida, west to Ohio, Missouri, Arkansas and Louisiana. Aug.–Oct.

6. Helianthus scabérrimus Ell. Stiff Sunflower. (Fig. 3903.)

H. scaberrimus Ell. Bot. S. C. & Ga. 2: 423. 1824.
H. rigidus Desf. Cat. Hort. Paris, Ed. 3, 184. 1829.

Perennial; stems simple or little branched, hispid or scabrate, 1°–8° high. Leaves thick, coriaceous, serrate or serrulate, very scabrous on both sides, 2′–7′ long, ½′–2′ wide, acute at the apex, narrowed at the base, the lower ovate or ovate-oblong, petioled, the upper lanceolate or oblong-lanceolate, sessile or short petioled, all opposite, or the uppermost bract-like and alternate; heads solitary or few, 2′–3′ broad; involucre hemispheric, its bracts ovate, acute or obtusish, ciliate; disk purple or brown; receptacle convex, its chaff obtuse; rays 15–25, light yellow; achenes more or less pubescent, oblong-obovate; pappus of 2 broad scales or of 2–4 stout awns.

Prairies, Minnesota to the Northwest Territory, south to Illinois, Georgia, Texas and Colorado. Aug.–Sept.

7. Helianthus occidentàlis Riddell. Few-leaved Sunflower. (Fig. 3904.)

H. occidentalis Ridd. Suppl. Cat. Ohio Pl. 13. 1836.

Perennial; stems appressed-pubescent or sometimes nearly glabrous, slender, mostly simple, 2°–3° high. Leaves mainly basal, firm, ovate or oblong-lanceolate, obtuse or obtusish at the apex, narrowed at the base, 3–5-nerved, serrulate or entire, scabrous above, pubescent beneath, with slender petioles of about their own length; stem usually bearing 1 or 2 pairs of small distant leaves; heads several or solitary, 1½′–2½′ broad; involucre hemispheric, its bracts lanceolate or ovate-lanceolate, acute or acuminate, generally ciliate, appressed; receptacle convex, its chaff acute; disk yellow; rays 12–15; achenes truncate and pubescent at the summit; pappus of 2 lanceolate-subulate awns.

In dry soil, Ohio to Minnesota, south to Florida and Missouri. Aug.–Sept.

8. Helianthus laevigàtus T. & G. Smooth Sunflower. (Fig. 3905.)

Helianthus laevigatus T. & G. Fl. N. A. 2: 330. 1842.

Stems slender, from a perennial root, simple or little branched, glabrous, or somewhat glaucous, 2°–6° high. Leaves nearly all opposite, firm, glabrous, lanceolate, short-petioled, or the upper sessile, serrulate or entire, pale beneath, acuminate, narrowed at the base, 3′–6′ long, ½′–1½′ wide, the margins sometimes roughish; heads few or solitary, 1′–1½′ broad; involucre campanulate, its bracts lanceolate or ovate-lanceolate, firm, ciliolate, the tips of the outer ones spreading; rays 5–10; disk yellow; chaff linear; achenes slightly pubescent at the summit; pappus of 2 lanceolate or ovate awns, with or without 2 intermediate scales.

In dry soil, mountains of Virginia and North Carolina. Aug.–Oct.

9. Helianthus microcéphalus T. & G. Small Wood Sunflower. (Fig. 3906.)

Helianthus parviflorus Bernh.; Spreng. Syst. 3: 617. 1826. Not H.B.K. 1820.
Helianthus microcephalus T. & G. Fl. N. A. 2: 329. 1842.

Stems slender, glabrous, branched above, or rarely simple, 3°–6° high. Leaves thin or thinnish, petioled, most of them opposite, lanceolate, or the lower ovate-lanceolate, rough above, canescent or puberulent beneath, long-acuminate at the apex, narrowed at the base, serrulate, or the lower serrate, 3′–7′ long, ½′–1½′ wide; heads commonly several or numerous, borne on slender, sometimes roughish peduncles, ½′–1¼′ wide; involucre campanulate, its bracts lanceolate or ovate, acute or acuminate, ciliolate, the tips of the outer ones spreading; chaff of the receptacle oblong, entire, or 3-toothed; rays 5–10; disk yellow; achenes nearly glabrous; pappus usually of 2 subulate awns.

In moist woods and along streams, Pennsylvania to Georgia, west to Ohio, Missouri and Louisiana. July–Sept.

10. Helianthus gigantèus L. Tall or Giant Sunflower. (Fig. 3907.)

Helianthus giganteus L. Sp. Pl. 905. 1753.

Perennial by fleshy roots and creeping rootstocks; stems hispid or scabrous, at least above, branched near the summit, or simple, 3°–12° high. Leaves sessile or short-petioled, firm, lanceolate, very rough above, rough-pubescent beneath, serrate or denticulate, acuminate at the apex, narrowed at the base, many or all of the upper ones alternate but sometimes all opposite, 2′–6′ long, ½′–1′ wide; heads usually several, mostly long-peduncled, 1½′–2½′ broad; involucre hemispheric, its bracts squarrose, lanceolate-subulate, hirsute or ciliate, commonly as long as the diameter of the yellowish disk; chaff of the receptacle oblong-linear, acute; achenes oblong, glabrous; rays 10–20; pappus of 2 subulate awns.

In swamps and wet meadows, Maine and Ontario to the Northwest Territory, south to Florida, Nebraska and Louisiana. Stem commonly purple. Aug.-Oct.

Helianthus gigantèus subtuberòsus (Bourgeau) Britton.

Helianthus subtuberosus Bourgeau; A. Gray, Syn. Fl. 1: Part 2, 276. As synonym. 1884.

Fleshy roots thick and edible. Leaves more broadly lanceolate and more sharply serrate, largely opposite. Michigan and Minnesota to the Northwest Territory.

11. Helianthus Maximiliàni Schrad. Maximilian's Sunflower. (Fig. 3908.)

Helianthus Maximiliani Schrad. Ind. Sem. Hort. Goett. 1835.

Perennial by fleshy roots and thickened rootstocks; stems stout, scabrous or hispid below, 2°–12° high. Leaves sessile or short-petioled, long-lanceolate, folding in drying, alternate or the lower opposite, very rough on both sides, rigid, acuminate or acute at both ends, denticulate or entire, 3′–7′ long, ½′–1½′ wide; heads few or numerous, 2′–3′ broad on stout densely rough-pubescent peduncles; involucre hemispheric, its bracts lanceolate, acuminate, squarrose, densely strigose-pubescent, often 9″ long; disk yellowish; rays 15–30; chaff linear, acute, pubescent above; achenes linear-oblong, glabrous or nearly so; pappus commonly of 2 lanceolate awns.

On dry prairies, Minnesota and Manitoba to the Northwest Territory, Nebraska and Texas. Aug.-Oct.

12. Helianthus grósse-serràtus Martens. Saw-tooth Sunflower. (Fig. 3909.)

Helianthus grosse-serratus Martens, Sel. Sem. Hort. Loven. 1839.

Perennial by fleshy roots and slender rootstocks; stems glabrous, glaucous, branched above, 6°–10° high, the branches usually strigose-pubescent; leaves long-lanceolate, slender-petioled, the upper alternate, the lower opposite, long-acuminate, narrowed at the base, sharply serrate, or merely denticulate, the uppermost entire, rough above, densely puberulent or canescent beneath, 4′–8′ long, ½′–1′ wide; heads several or numerous, 1½′–3′ broad; involucre hemispheric, its bracts squarrose, narrowly lanceolate, acuminate, hirsute; chaff linear-oblong, pubescent at the summit, acute, often 3-toothed; disk yellowish; rays 10–20, deep yellow; achenes nearly glabrous; pappus of 2 lanceolate awns.

On prairies, Pennsylvania to South Dakota, Missouri and Texas. Reported from further east. Aug.-Oct.

Helianthus Nuttàllii T. & G., a low Rocky Mountain plant with smaller heads, slender usually simple stem, and entire or serrulate leaves, may occur in the western part of our area.

13. Helianthus divaricàtus L. Rough or Woodland Sunflower. (Fig. 3910.)

Helianthus divaricatus L. Sp. Pl. 906. 1753.

Perennial by slender rootstocks; stem glabrous throughout, or pubescent at the summit, slender, 2°–7° high. Leaves usually all opposite, divaricate, lanceolate or ovate-lanceolate, firm, dentate or denticulate, 3-nerved, rough above, pubescent beneath, sessile, or nearly so by a truncate base, tapering gradually to the long-acuminate apex, 3′–8′ long, ¼′–1½′ wide; heads few or solitary, about 2′ broad, borne on strigose-pubescent peduncles; involucre hemispheric, its bracts lanceolate or ovate-lanceolate, strigose or hirsute, the outer ones spreading; disk yellow; rays 8–15; chaff of the receptacle apiculate; achenes glabrous; pappus of 2 short subulate awns.

In dry woodlands, Ontario to the Northwest Territory, south to Florida, Nebraska and Louisiana. July–Sept.

14. Helianthus móllis Lam. Hairy Sunflower. (Fig. 3911.)

Helianthus mollis Lam. Encycl. 3: 85. 1789.

Perennial; stem stout, simple, or sparingly branched above, densely hirsute or hispid, 2°–4° high. Leaves ovate or ovate-lanceolate, closely sessile and somewhat clasping by a broad cordate base, pinnately veined, 3-nerved above the base, all opposite, or the upper alternate, ascending, acute or acuminate, scabrous or cinereous-pubescent above, densely and finely pubescent beneath, serrulate, 2′–5′ long, 1′–2½′ wide; heads solitary or few, 2′–3′ broad; involucre hemispheric, its bracts lanceolate, acuminate, densely villous canescent, somewhat spreading; disk yellow; rays 15–25; chaff canescent at the summit; mature achenes nearly glabrous; pappus of 2 lanceolate scales.

In dry barren soil, Ohio to Georgia, west to Iowa, Missouri and Texas. Aug.–Sept.

15. Helianthus doronicoìdes Lam. Oblong-leaved Sunflower. (Fig. 3912.)

Helianthus doronicoides Lam. Encycl. 3: 84. 1789.

Perennial by slender rootstocks; stems stout, rough, or finely rough-pubescent, branched above, 3°–7° high. Leaves oblong, ovate-oblong, or ovate, thick, ascending, serrate or serrulate, acute or acuminate at the apex, narrowed at or below the middle to a sessile or slightly clasping base, rough on both sides, or finely pubescent beneath, somewhat 3-nerved, 4′–8′ long, 1′–2½′ wide; heads commonly numerous, 2½′–4′ broad; involucre hemispheric, its bracts lanceolate, acuminate, pubescent or hirsute, somewhat spreading; disk yellow; rays 12–20, 4″–6″ wide; achenes glabrous; pappus of 2 subulate awns.

In dry soil, Ohio to Michigan, Missouri and Arkansas. Aug.–Sept.

16. Helianthus decapétalus L. Thin-leaved or Wild Sunflower. (Fig. 3913.)

Helianthus decapetalus L. Sp. Pl. 905. 1753.

Perennial by branched, sometimes thickened rootstocks; stem slender, glabrous or nearly so, branched above, 1°–5° high; branches puberulent. Leaves thin or membranous, 3′–8′ long, 1′–3′ wide, ovate or ovate-lanceolate, the lower all opposite and slender-petioled, the upper commonly alternate, all usually sharply serrate, roughish above, finely but often sparingly pubescent beneath, acuminate, the rounded or truncate base decurrent on the petiole; heads numerous, 2′–3′ broad; involucre hemispheric, its bracts linear-lanceolate, acuminate, hirsute, ciliate, spreading, often longer than the yellow disk; rays 8–15, light yellow; chaff entire or 3-toothed, pubescent at the apex; achenes glabrous; pappus of 2 subulate awns.

In moist woods and along streams, Quebec to Michigan, south to Georgia and Kentucky. Aug.–Sept.

17. Helianthus tracheliifòlius Mill. Throatwort Sunflower. (Fig. 3914.)

Helianthus tracheliifolius Mill. Gard. Dict. Ed. 8, No. 7. 1768.

Similar to the following species, but the stem usually roughish-pubescent. Leaves short-petioled, ovate-lanceolate, 3-nerved near the base, green both sides, but darker above, generally rougher on the upper surface, the lower ones sharply serrate; branches and peduncles scabrous; heads several, 2½′–3½′ broad; bracts of the hemispheric involucre linear-lanceolate, long-acuminate, ciliate and puberulent, longer than the yellow disk, sometimes foliaceous, and 3 times its length.

In dry soil, Pennsylvania and Ohio to Wisconsin. Aug.–Sept.

18. Helianthus strumòsus L. Pale-leaved Wood Sunflower. (Fig. 3915.)

Helianthus strumosus L. Sp. Pl. 905. 1753.

Perennial by branched, sometimes tuberous-thickened rootstocks; stem glabrous below, sometimes glaucous, 3°–7° high, branched above, the branches usually pubescent. Leaves short-petioled, ovate or ovate-lanceolate, not membranous, rough above, pale and somewhat puberulent or canescent beneath, serrate, serrulate, or nearly entire, acuminate, contracted much below the middle and decurrent on the petiole, 3-nerved above the base, 3′–8′ long, 1′–2½′ wide, mostly opposite, the upper often alternate; heads commonly several, 2½′–4′ broad; involucre hemispheric, its bracts lanceolate or ovate-lanceolate, acuminate, ciliate, equalling or a little longer than the diameter of the yellow disk; rays 5–15; chaff pubescent; achenes nearly glabrous.

In dry woods and on banks, Maine and Ontario to Minnesota, Georgia and Arkansas. July–Sept.

Helianthus strumòsus macrophýllus (Willd.) Britton, Mem. Torr. Club, 5: 335. 1894.

Helianthus macrophyllus Willd. Hort. Berol. *pl. 70.* 1806.
Helianthus mollis Willd. Sp. Pl. 3: 2240. 1804. Not Lam. 1789.
H. strumosus var. *mollis* T. & G. Fl. N. A. 2: 327. 1842.

Leaves finely and densely canescent beneath. Massachusetts to Pennsylvania and Iowa.

19. Helianthus hirsùtus Raf. Stiff-haired Sunflower. (Fig. 3916.)

Helianthus hirsutus Raf. Ann. Nat. 14. 1820.

Perennial; stem densely hirsute, usually branched above, stout, rigid, 2°–4° high. Leaves ovate-lanceolate or the upper lanceolate, rounded, truncate or subcordate at the base, acuminate at the apex, thick, very rough above, rough-pubescent beneath, 3-nerved, serrate or serrulate, 3′–6′ long, ½′–2′ wide, short-petioled, or the uppermost sessile, nearly all opposite; heads usually several, 2′–3½′ broad; involucre hemispheric, its bracts lanceolate, or ovate-lanceolate, acuminate, ciliate, mostly puberulent, erect or but slightly spreading, equalling or shorter than the yellow disk; rays 12–15; chaff obtusish, pubescent at the summit; achenes oval, rounded at the summit, glabrous; pappus of 1 or 2 subulate awns.

In dry soil, Pennsylvania and Ohio to Wisconsin, south to West Virginia, Georgia and Texas. July–Oct.

Helianthus hirsùtus trachyphýllus T. & G. Fl. N. A. 2: 329. 1842.

Leaves thick, very rough on both sides; heads larger; involucral bracts more spreading. Nebraska to Arkansas.

20. Helianthus laetiflòrus Pers. Showy Sunflower. (Fig. 3917.)

Helianthus laetiflorus Pers. Syn. 2: 476. 1807.

Perennial; stem scabrous or hispid, leafy, 4°–8° high. Leaves oval-lanceolate or ovate lanceolate, short-petioled, 3-nerved, rough on both sides, narrowed at the base, long-acuminate at the apex, serrate or serrulate, 4′–10′ long, ½′–2½′ wide, the upper often alternate; heads usually several, 2′–4′ broad, mostly short-peduncled; bracts of the hemispheric involucre ovate-lanceolate, or oblong-lanceolate, imbricated in only 2 or 3 series, ciliate, otherwise nearly glabrous, appressed or but little spreading, shorter than or equalling the yellow disk; rays 15–25, showy; chaff of the receptacle entire, or sometimes 3-toothed.

On prairies and barrens, Pennsylvania and Ohio to Minnesota. Aug.–Sept.

21. Helianthus tomentòsus Michx. Woolly Sunflower. (Fig. 3918.)

Helianthus tomentosus Michx. Fl. Bor. Am. 2: 141. 1803.

Perennial; stem stout, hirsute or hispid, especially above, branched, 4°–10° high. Leaves rather thin, ovate, or the lower oblong, mostly alternate, 3-ribbed above the base, gradually or abruptly contracted into margined petioles, rough above, softly villous-pubescent beneath, sparingly serrate, the lower often 1° long and 4′ wide; heads commonly several or numerous, 3′–4′ broad; involucre hemispheric, its bracts imbricated in many series, linear-lanceolate, long-acuminate, squarrose, densely hirsute and ciliate, usually longer than the broad yellowish disk; chaff of the receptacle and lobes of the disk corollas pubescent; pappus of 2 subulate awns.

In dry soil, Virginia to Georgia and Alabama. Reported from Illinois. Aug.–Oct.

22. Helianthus tuberòsus L. Jerusalem Artichoke. Earth Apple. (Fig. 3919.)

Helianthus tuberosus L. Sp. Pl. 905. 1753.

Perennial by fleshy thickened rootstocks, bearing tubers; stems hirsute or pubescent, branched above, 6°–12° high. Leaves ovate or ovate-oblong, firm, 3-nerved near the base, narrowed, or the lower rounded, truncate or subcordate at the base, acuminate at the apex, rather long-petioled, scabrous above, finely pubescent beneath, serrate, 4′–8′ long, 1½′–3′ wide, the upper alternate, the lower opposite; heads several or numerous, 2′–3½′ broad; involucre hemispheric, its bracts lanceolate, acuminate, hirsute or ciliate, squarrose; disk yellow; rays 12–20; chaff of the receptacle acute and pubescent at the summit; achenes pubescent.

In moist soil, New Brunswick and Ontario to the Northwest Territory, south to Georgia and Arkansas. Often occurs along roadsides in the east, a relic of cultivation by the aborigines. Now extensively grown for its edible tubers. Called also Canada Potato, Girasole, Topinambour. Sept.–Oct.

Helianthus tuberòsus subcanéscens A. Gray, Syn. Fl. 1: Part 2: 280. 1884.

Lower; leaves densely white canescent beneath. Prairies, Minnesota to the Northwest Territory, south to Missouri.

65. VERBESÌNA L. Sp. Pl. 901. 1753.

[ACTINOMERIS Nutt. Gen. 2: 181. 1818.]

Perennial or annual, pubescent or scabrous herbs (some tropical species shrubby), with alternate or opposite leaves often decurrent on the stem and branches, and corymbose or solitary heads of both tubular and radiate yellow or white flowers, or the rays sometimes wanting. Involucre campanulate or hemispheric, its bracts imbricated in few series. Receptacle convex or conic, chaffy, the chaff embracing the disk-flowers. Ray-flowers pistillate or neutral. Disk-flowers perfect, mostly fertile, their corollas with an expanded 5-lobed limb, usually longer than the tube. Style-branches of the disk-flowers with acute papillose appendages. Achenes flattened, or those of the ray-flowers 3-sided, their margins winged or wingless. Pappus of 2 (1–3) subulate awns, sometimes with 2 or 3 intermediate scales. [Name altered from *Verbena*.]

A large genus, variously restricted by authors, mainly natives of the New World. Besides the following, about 6 others occur in the southern and southwestern United States.

Involucre campanulate, 2″–3″ broad; heads small, numerous.
- Leaves alternate; rays white. — 1. *V. Virginica.*
- Leaves opposite; rays yellow. — 2. *V. occidentalis.*

Involucre hemispheric, 7″–12″ broad; heads few, large.
- Leaves ovate, sessile, serrate. — 3. *V. helianthoides.*
- Leaves deltoid, petioled, coarsely dentate. — 4. *V. encelioides.*

Involucre of a few, at length deflexed bracts; disk globose. — 5. *V. alternifolia.*

1. Verbesina Virgínica L. Small White or Virginia Crownbeard. (Fig. 3920.)

Verbesina Virginica L. Sp. Pl. 901. 1753.

Perennial; stem densely puberulent, terete or winged, simple or branched, 3°–6° high. Leaves usually thin, alternate, ovate, roughish above, puberulent, canescent or glabrate beneath, acute or acuminate at the apex, 4′–10′ long, 1′–3′ wide, contracted at the base into winged petioles, the uppermost sessile, lanceolate, smaller, often entire; heads corymbose-paniculate at the ends of the stem and branches, numerous, 6″–10″ broad; involucre oblong-campanulate, 2″–3″ broad, its bracts narrowly lanceolate, erect, obtuse, pubescent; rays 3–5, obovate, white, pistillate; achenes minutely pubescent, winged or wingless; pappus of 2 slender awns, or sometimes none.

In dry soil, Pennsylvania (according to Michaux), Virginia to Illinois and Missouri, south to Florida and Texas. Aug.–Sept.

2. Verbesina occidentàlis (L.) Walt. Small Yellow Crownbeard. (Fig. 3921.)

Siegesbeckia occidentalis L. Sp. Pl. 900. 1753.
Verbesina occidentalis Walt. Fl. Car. 213. 1788.
V. Siegesbeckia Michx. Fl. Bor. Am. 2: 134. 1803.

Perennial; stem glabrous, or puberulent above, usually much branched, narrowly 4-winged, 3°–7° high, the branches also winged and pubescent. Leaves thin, ovate, or the upper oblong, opposite, minutely rough pubescent on both sides, or glabrate, acuminate at the apex, narrowed or contracted below into slender margined or naked petioles, serrate, 4′–10′ long, 1′–3½′ wide; heads numerous, 6″–12″ broad, corymbose at the ends of the stem and branches; involucre oblong-campanulate, 2″–3″ broad, its bracts lanceolate, obtuse, erect, or the tips slightly spreading, pubescent; rays 1–5, yellow, usually pistillate, rarely none; achenes wingless; pappus of 2 slender, at length divergent awns.

In dry thickets and on hillsides, Maryland and southern Pennsylvania to Illinois, south to Florida and Georgia. Aug.-Oct.

3. Verbesina helianthoìdes Michx. Sunflower Crownbeard. (Fig. 3922.)

Verbesina helianthoides Michx. Fl. Bor. Am. 2: 135. 1803.
Actinomeris helianthoides Nutt. Gen. 2: 181. 1818.

Perennial; stem hispid or hirsute, 4-winged, usually simple, 2°–4° high. Leaves ovate or oval, sessile, acute, acuminate or obtuse at the apex, narrowed at the base, serrate or serrulate, rough or appressed-hispid above, densely pubescent or canescent beneath, 2′–4′ long, 1′–1½′ wide, all alternate, or the lower opposite; heads solitary or few, 2′–3′ broad; involucre hemispheric, about ½′ high, its bracts lanceolate, acutish, canescent, appressed; rays 8–15, pistillate or neutral, linear-oblong, yellow; achenes scabrous or pubescent, broadly winged; pappus of 2 subulate awns.

On dry prairies and in thickets, Ohio to Georgia, west to Iowa, Missouri and Texas. June-July.

4. Verbesina encelioìdes (Cav.) A. Gray. Golden Crownbeard. (Fig. 3923.)

Ximenesia encelioides Cav. Icon. 2: 60. *pl. 178.* 1793.
V. encelioides A. Gray, Syn. Fl. 1: Part 2, 288. 1884.

Annual; stem densely puberulent, much branched, 1°–2° high. Leaves deltoid-ovate or deltoid-lanceolate, thin, 2′–4′ long, acuminate, acute or blunt at the apex, coarsely dentate, or even laciniate, green and minutely pubescent above, pale and densely canescent beneath, all alternate, or the lowest opposite, narrowed at the base into naked or wing-margined petioles, which are often provided with dilated appendages at the base; heads several or numerous, 1′–2′ broad; involucre hemispheric, about ½′ high, its bracts lanceolate, canescent; rays 12–15, bright golden yellow, 3-toothed; achenes of the disk-flowers obovate, winged, pubescent, their pappus of 2 subulate awns; those of the ray-flowers rugose, thickened, often wingless.

In moist soil, Kansas to Texas, Arizona and Mexico. Also in Florida and widely distributed in warm regions as a weed. Summer.

5. Verbesina alternifòlia (L.) Britton. Actinomeris. (Fig. 3924.)

Coreopsis alternifolia L. Sp. Pl. 909. 1753.
Actinomeris squarrosa Nutt. Gen. 2: 181. 1818.
Actinomeris alternifolia DC. Prodr. 5: 575. 1836.
Verbesina alternifolia Britton; Kearney, Bull. Torr. Club, 20: 485. 1893.

Perennial; stem puberulent or glabrous, narrowly winged, or wingless, simple, or branched near the summit, leafy, 4°–9° high. Leaves oblong-lanceolate or lanceolate, acuminate, serrate, serrulate or entire, rough or roughish on both sides, gradually narrowed to the sessile base, or the lower short-petioled, 4′–12′ long, ½′–2½′ wide, sessile, short-petioled, alternate, or the lower opposite and sleuder-petioled; heads numerous, 1′–2′ broad, corymbose-paniculate; rays 2–10, yellow; involuere of few lanceolate, at length deflexed bracts; disk globose, yellow; achenes broadly winged or nearly wingless, sparingly pubescent; pappus 2 divergent awns.

In rich soil, New Jersey to western New York, Iowa, Florida and Louisiana. Aug.-Sept.

66. COREÓPSIS L. Sp. Pl. 907. 1753.

Annual or perennial, mostly erect herbs, with opposite leaves, or the upper alternate, and large long-pedunceled heads of both tubular and radiate flowers, the rays yellow, or brown at the base, or brown throughout, or piuk. Involuere usually hemispheric, its bracts in 2 distinct series, all united at the base, those of the outer series commonly narrower and shorter than the inner. Receptacle flat or slightly convex, chaffy, the chaff flat or concave. Ray-flowers neutral. Disk-flowers perfect, fertile, their corollas with sleuder tube and broader 5-toothed limb. Anthers mostly eutire at the base. Style-tips truncate or subulate. Achenes flat, orbicular to oblong, winged or wingless. Pappus of 2 short teeth, or a mere coroniform border, or none. [Greek, bug-like, referring to the achenes.]

About 50 species, natives of America, South Africa and Australasia, known as Tickseed. In addition to the following, some 10 others occur in the southern and western United States.

* Rays pink, or occasionally white; leaves linear, entire. 1. *C. rosea.*

* * Rays yellow with a brown base, or brown; lower leaves pinnately divided.

Lobes of the lower leaves oblong or oval; achenes winged. 2. *C. cardaminefolia.*
Leaf-lobes all linear-lanceolate; achenes wingless. 3. *C. tinctoria.*

* * * Rays yellow throughout.

1. Leaves sessile, rigid, palmately 3-lobed below the middle. 4. *C. palmata.*
2. Leaves sessile, some or all 3-divided to the base, appearing verticillate.
Leaf-segments oblong or lanceolate, entire. 5. *C. major.*
Leaf-segments 1–2-pinnately parted.
Divisions of the segments linear-lanceolate. 6. *C. delphinifolia.*
Divisions of the segments very narrowly linear. 7. *C. verticillata.*
3. Stem-leaves sessile or petioled, entire, or the lower 3–5-lobed; achenes often with a callus at each end on the inner side.
Glabrous or nearly so; stem leaves lanceolate; achenes winged. 8. *C. lanceolata.*
Plants hirsute, hispid or pubescent at least below.
Plant leafy, 2°–4° high; stem leaves oblong, acutish. 9. *C. pubescens.*
Leaves few; plants 1°–2° high: stem leaves mostly obtuse.
Achenes broadly winged; basal leaves oblong. 10. *C. crassifolia.*
Achenes narrowly winged; basal leaves nearly orbicular. 11. *C. auriculata.*
4. Leaves, or most of them, 1–2-parted into linear segments; rays lobed. 12. *C. grandiflora.*
5. Leaves petioled, all but the upper pinnately 3–5-divided, rays entire. 13. *C. tripteris.*

1. Coreopsis ròsea Nutt. Small Rose or Pink Tickseed. (Fig. 3925.)

Coreopsis rosea Nutt. Gen. 2: 179. 1818.

Perennial by slender rootstocks; stems at leugth much branched, slender, strict, glabrous, 6′–24′ high. Leaves opposite, linear, glabrous, entire, obscurely 1-nerved, 1′–2½′ long, ½″–1″ wide, sessile, or the lower petioled; heads slender-pedunceled, several or numerous, 6″–12″ broad; disk yellow; rays 4–8, pink or rose-colored (occasionally white), oblong to obovate, slightly 3-toothed or sometimes eutire; inner bracts of the hemispheric iuvoluere ovate-oblong, acutish or obtuse, glabrous, mueh longer than the lanceolate outer ones; style-tips yellow, truncate; achenes oblong or linear-oblong, thin, not winged, nearly straight, slightly ribbed on the iuner face; pappus a very short truncate crown.

In open swamps, eastern Massachusetts to Georgia, near the coast. July–Aug.

2. Coreopsis cardaminefòlia (DC.) T. & G. Cress-leaved Tickseed. (Fig. 3926.)

Calliopsis cardaminefolia DC. Prodr. 5: 568. 1836.
Coreopsis cardaminefolia T. & G. Fl. N. A. 2: 346. 1842.

Annual; stem glabrous, branched, 1°–2½° high. Basal leaves petioled, 2′–4′ long, 1–2-pinnately parted into oblong or oval obtuse segments, the petioles sometimes slightly ciliate; stem-leaves distant, sessile, or nearly so, pinnately parted into linear segments, or the uppermost entire; heads 8″–12″ broad, slender-pedunculed; involucre hemispheric, its inner bracts brown, ovate or ovate-lanceolate, obtuse or obtusish, scarious-margined, much longer than the lanceolate obtusish outer ones; rays 4–8, yellow with a brown base, 3-toothed; achenes oval, 1″–1½″ long, winged, smooth, or slightly papillose; pappus of 2 minute awns, or none.

In moist soil, Kansas to New Mexico, Louisiana and northern Mexico. May–Oct.

3. Coreopsis tinctòria Nutt. Garden Tickseed. (Fig. 3927.)

Coreopsis tinctoria Nutt. Journ. Acad. Phila. 2: 114. 1821.

Annual; stem glabrous, branched, 1°–3½° high. Leaves 1–2-pinnately divided into linear obtusish mostly entire segments, or the uppermost linear and entire, the lower petioled; heads slender-peduncled, 10″–12″ broad, or in cultivation much broader; involucre hemispheric, its inner bracts brown, ovate or oblong, obtuse or acute, scarious-margined, 3–5 times as long as the obtuse outer ones; rays 6–10, cuneate, yellow with a brown base or brown all over; style-tips truncate; achenes linear or linear-oblong, about 1″ long, wingless; pappus a mere border, or none.

In moist soil, Minnesota to the Northwest Territory, south to Nebraska, Louisiana and Arizona. Escaped from gardens to roadsides and waste places eastward. May–Sept.

4. Coreopsis palmàta Nutt. Stiff Tickseed. (Fig. 3928.)

Coreopsis palmata Nutt. Gen. 2: 180. 1818.

Perennial, stems rigid, glabrous, simple, or little branched, very leafy, 1°–3° high. Leaves sessile, 2′–3′ long, palmately 3-lobed at or below the middle, or the uppermost entire, thick, rigid, the lobes linear-oblong, obtusish, entire, or with 1–3 lateral lobes, their margins rough; heads few or solitary, short-peduncled, 1′–2′ broad; involucre hemispheric, its bracts somewhat united at the base, those of the outer series narrower and nearly as long as the inner ones; rays 6–10, bright yellow, oblong or obovate, mostly 3-toothed; achenes oblong, narrowly winged, slightly incurved; pappus of 2 short tips, or none.

On dry prairies and in thickets, Illinois to Louisiana, west to Minnesota, Manitoba, Nebraska and Texas. June–July.

5. Coreopsis màjor Walt. Wood, or Greater Tickseed. (Fig. 3929.)

Coreopsis major Walt. Fl. Car. 214. 1788.
Coreopsis senifolia Michx. Fl. Bor, Am. 2: 138. 1803.

Perennial; stem pubescent, branched above, 2°–3° high. Leaves scssile, more or less pubescent, or glabrous, divided to the base into 3, lauceolate or oblong, acute entire segments 2′–4′ long, 4″–12″ wide, which appear as if in verticils of 6; upper and lower leaves (rarely all of them), undivided and entire; heads several or numerous, slender-peduncled, 1′–2′ broad; bracts of the hemispheric involucre all united at the base, the outer ones linear-oblong, obtuse, equalling or shorter than the broader inner ones, all pubescent; rays 6–10, yellow, oblong, entire; disk yellow; achenes oblong to elliptic, winged, ½″–2″ long; pappus of 2 short deciduous teeth.

In dry sandy woods, Virginia (according to Watson and Coulter), North Carolina to Florida. July–Aug.

Coreopsis màjor Oèmleri (Ell.) Britton, Mem. Torr. Club, 4: 131. 1894.
Coreopsis OEmleri Ell. Bot. S. C. & Ga. 2: 435. 1824.
Coreopsis stellata Nutt. Journ. Acad. Phila. 7: 76. 1834.
Coreopsis senifolia var. *stellata* T. & G. Fl. N. A. 2: 342. 1842.

Plant glabrous throughout; leaf-segments often narrower. Virginia and West Virginia to Georgia.

6. Coreopsis delphinifòlia Lam. Larkspur Tickseed. (Fig. 3930.)

Coreopsis delphinifolia Lam. Encycl. 2: 108. 1786

Perennial; stem glabrous, branched above, rather slender, 1°–3° high. Leaves scssile, 1–2-ternately parted into linear or linear-lanceolate segments which are 1′–2′ long, 1″–3″ wide; heads several or numerous, 1½′–2′ broad; involucre hemispheric, its bracts glabrous, the outer linear-oblong, obtuse, shorter than or equalling the ovate-oblong inner ones; rays 6–10, yellow, entire; disk brown; achenes oblong to oval, narrowed at the base, narrowly winged; pappus of 2 short teeth.

In dry woods, Virginia (according to Torrey and Gray), North Carolina to Georgia and Alabama. Aug.–Sept.

7. Coreopsis verticillàta L. Whorled Tickseed. (Fig. 3931.)

Coreopsis verticillata L. Sp. Pl. 907. 1753.

Perennial; stem stiff, much branched, slender, leafy, 1°–2° high. Leaves sessile, glabrous, 2–3-ternately dissected into linear-filiform entire segments; heads numerous, 1′–1½′ broad; involucre hemispheric, or short-cyliudric in fruit, glabrous, its outer bracts linear, obtuse, commonly somewhat shorter and much narrower than the ovate-oblong inner ones; rays 6–10, yellow, spatulate-oblong, obtuse; disk dull yellow; achenes oblong, narrowly winged, 2″ long; pappus of 2 short teeth.

In dry soil, western Ontario to northern Michigan, south to Maryland, North Carolina, Kentucky, Nebraska and Arkansas. June–Sept.

8. Coreopsis lanceolàta L. Lance-leaved Tickseed. (Fig. 3932.)

Coreopsis lanceolata L. Sp. Pl. 908. 1753.
Coreopsis lanceolata var. *angustifolia* T. & G. Fl. N. A. 2: 344. 1842.

Perennial; stem slender, glabrous, or sparingly hispid near the base, 1°–2° high. Leaves glabrous, the lower and basal ones slender-petioled, spatulate or narrowly oblong, very obtuse, 2′–6′ long, entire, or with 1–3 lateral obtuse entire lobes; stem leaves few, sessile or nearly so, lanceolate or oblong, obtuse or acutish, usually quite entire; heads few or solitary on elongated slender peduncles, 1½′–2½′ broad, showy; peduncles often 12′ long; involucre depressed-hemispheric, its bracts glabrous or ciliate, lanceolate or ovate-lanceolate, the outer narrower than the inner, but nearly as long; rays 6–10, bright yellow, cuneate, 3–7-lobed; achenes oblong, broadly winged, about 1″ long; pappus of 2 short teeth.

In dry or moist soil, western Ontario to Virginia, Florida, Louisiana and Missouri. May–Aug.

9. Coreopsis pubéscens Ell. Star Tickseed. (Fig. 3933.)

Coreopsis pubescens Ell. Bot. S. C. & Ga. 2: 441. 1824.

Perennial; stem pubescent or puberulent, leafy, little branched, or simple, erect, 2°–4° high. Leaves pubescent or glabrous, entire, or some of them 3–5-lobed or divided, the basal and lower ones slender-petioled, obovate-oval, obtuse, the upper short-petioled or sessile, broadly lanceolate or oblong, acute or acutish, 2′–3′ long; heads few, 1′–1½′ broad, long-peduncled; involucre depressed-hemispheric, glabrous, star-like, its lanceolate obtuse or acute outer bracts nearly as long as but much narrower than the ovate inner ones; rays 8–10, yellow, cuneate, lobed at the apex; achenes similar to those of the preceding species or broader.

In dry woods, Virginia to Illinois and Missouri, south to Florida and Louisiana. June–Aug.

10. Coreopsis crassifòlia Ait. Thick-leaved or Hairy Tickseed. (Fig. 3934.)

Coreopsis crassifolia Ait. Hort. Kew. 3: 253. 1789.
Coreopsis lanceolata var. *villosa* Michx. Fl. Bor. Am. 2: 137. 1803.

Perennial; stem hirsute or villous-pubescent below, ascending, little branched, 8′–20′ high. Leaves rather thick, hirsute or pubescent, all entire, the lower and basal ones petioled, oblong to obovate-spatulate, mostly very obtuse, 1′–3′ long, 4″–10″ wide; stem leaves few, short-petioled or sessile, obtuse or acutish, narrower; heads few, 1′–2′ broad, borne on slender, puberulent peduncles often 1° long, similar to those of *C. lanceolata*, as are the rays, involucral bracts and achenes.

Dry soil, Illinois to Louisiana, east to South Carolina and Florida. May–Aug.

11. Coreopsis auriculàta L. Running or Lobed Tickseed. (Fig. 3935.)

Coreopsis auriculata L. Sp. Pl. 908. 1753.

Perennial; stoloniferous; stems weak, very slender, decumbent or ascending, 6′–15′ long, little branched, or simple, pubescent or hirsute, at least below. Leaves thin, entire or pinnately 3–5-lobed or 3–5-divided, the terminal segment entire and much larger than the lateral ones, the lower and basal more or less pubescent, broadly oblong or nearly orbicular, with slender pubescent petioles; stem leaves few, petioled or sessile, mostly obtuse; heads 1′–1½′ broad, slender-peduncled; outer bracts of the involucre oblong, narrower than the mostly ovate and acute inner ones; rays 6–10, cuneate, about 4-toothed, yellow; achenes oval, narrowly winged, the wings involute and thick.

In woods, Virginia to Kentucky, south to Florida and Louisiana. May–Aug.

12. Coreopsis grandiflòra Hogg. Large-flowered Tickseed. (Fig. 3936.)

Coreopsis grandiflora Hogg; Sweet, Brit. Fl; Garn. 2: *pl. 175.* 1825–27.

Perennial (or sometimes annual?); stem glabrous, usually branched above, 1°–3° high. Leaves, or most of them, 1–2-pinnately parted, or the lower entire and slender-petioled; segments of the lower stem leaves oblong, obtuse, the terminal one larger than the lateral; segments of most of the stem leaves linear or even filiform; petioles ciliate; heads commonly several, 1′–2′ broad, long-peduncled; outer bracts of the involucre lanceolate, narrower and mostly shorter than the oval or ovate-lanceolate inner ones; rays 6–10, yellow, lobed; achenes oblong, broadly winged when mature, the projections on the inner face usually large; pappus of 2 short scales.

In moist soil, Missouri to Texas, east to Georgia. May–Aug.

13. Coreopsis trípteris L. Tall Tickseed. (Fig. 3937.)

Coreopsis tripteris L. Sp. Pl. 908. 1753.

Perennial; stem glabrous, much branched above, 4°–8° high. Leaves petioled, glabrous, or very nearly so, firm, the lower all divided into lanceolate entire acute rough-margined segments, which are 2′–5′ long, ¼′–1′ wide and pinnately veined; uppermost leaves lanceolate, entire; heads numerous, slender-peduncled, 1′–1½′ broad; outer bracts of the involucre linear, obtusish, much narrower than the ovate-oval or ovate-lanceolate, acute inner ones; rays 6–10, yellow, obtuse, entire; achenes oblong to obovate, narrowly winged, emarginate; pappus none.

In moist woods and thickets, Pennsylvania to Wisconsin, south to Virginia, Florida and Louisiana. July–Oct.

67. BIDENS L. Sp. Pl. 831. 1753.

Annual or perennial herbs, with opposite serrate lobed divided or dissected leaves, or the uppermost alternate, and mostly large heads of both tubular and radiate flowers, or the rays none, or rudimentary. Involucre campanulate or hemispheric, its bracts in 2 series, distinct, or slightly united at the base; the outer often foliaceous and much larger than the inner. Receptacle flat or nearly so, chaffy, the chaff subtending the disk-flowers. Rays, when present, neutral, mostly entire, yellow in our species. Disk-flowers perfect, fertile, their corollas tubular, 5-toothed. Anthers entire, or minutely sagittate at the base. Style-branches with short or subulate tips. Achenes flat, quadrangular or nearly terete, cuneate, oblong, or linear. Pappus of 2–6 teeth or subulate awns, upwardly or downwardly barbed or hispid. [Latin, two-toothed, referring to the achenes.]

About 60 species of wide geographic distribution. Besides the following, about 8 others occur in the southern and southwestern United States.

Plants terrestrial, erect; leaves simple, or divided.
- Leaves lanceolate, serrate, undivided, rarely 3–5-lobed.
  - Rays present, large and conspicuous.
    - Heads persistently erect. 1. *B. laevis.*
    - Heads nodding after flowering. 2. *B. cernua.*
  - Rays rudimentary, or none.
    - Heads nodding after flowering. 2. *B. cernua.*
    - Heads persistently erect.
      - Pappus awns downwardly barbed.
        - Involucral bracts not foliaceous; stem purple; flowers orange. 3. *B. connata.*
        - Involucral bracts foliaceous; stem straw-color; flowers greenish yellow. 4. *B. comosa.*
      - Pappus awns upwardly barbed. 5. *B. bidentoides.*
- Leaves some, or all of them, pinnately 1–3-parted or dissected.
  - Rays rudimentary, or none, or very short.
    - Achenes flat; leaves, some or all of them, 1–3-divided.
      - Leaves membranous; heads 2″–3″ high. 6. *B. discoidea.*
      - Leaves not membranous; heads 5″–7″ high. 7. *B. frondosa.*
    - Achenes linear; leaves dissected. 8. *B. bipinnata.*
  - Rays large and conspicuous.
    - Achenes sparingly pubescent, not ciliate; pappus of 2 short teeth. 9. *B. coronata.*
    - Achenes ciliate; pappus 2–4 subulate teeth or awns.
      - Achenes cuneate, or linear-cuneate. 10. *B. trichosperma.*
      - Achenes obovate, very flat.
        - Bracts of the involucre glabrous, or ciliate, short. 11. *B. aristosa.*
        - Outer bracts densely hispid, much longer than the inner. 12. *B. involucrata.*

Plant aquatic; submersed leaves filiformly dissected. 13. *B. Beckii.*

1. Bidens laèvis (L.) B.S.P. Larger or Smooth Bur-Marigold. Brook Sunflower. (Fig. 3938.)

3/5

Helianthus laevis L. Sp. Pl. 906. 1753.
Bidens chrysanthemoides Michx. Fl. Bor. Am. 2: 136. 1803.
Bidens laevis B.S.P. Prel. Cat. N. Y. 29. 1888.

Annual; glabrous throughout; stems branched, erect or ascending, 1°–2° high. Leaves sessile, lanceolate, evenly serrate or serrulate, acuminate at the apex, narrowed to the sometimes connate-perfoliate base, 3′–8′ long, ¼′–1′ wide; heads numerous, short-peduncled, erect, 1′–2½′ broad; rays very showy, golden yellow; involucre hemispheric, its outer bracts linear-oblong or spatulate, equalling or exceeding the broader, ovate or oblong, membranous inner ones; rays 8–10, obovate-oblong, obtuse; achenes cuneate, truncate, 2″ long, retrorsely hispid on the margins; pappus of 2–4 (usually 2), rigid downwardly barbed awns.

In swamps and wet meadows, Quebec to Ontario and Minnesota, south to Florida, Louisiana, Mexico and southern California. Aug.–Nov.

2. Bidens cérnua L. Smaller or Nodding Bur-Marigold. (Fig. 3939.)

Bidens cernua L. Sp. Pl. 832. 1753.
Coreopsis Bidens L. loc. cit. 908. 1753.

Annual; stems glabrous, or hispid, usually erect, branched, 3′–3° high. Leaves sessile and commonly somewhat connate-perfoliate at the base, lanceolate to oblong-lanceolate, usually coarsely and sharply serrate, glabrous, acuminate, 3′–6′ long, ¼′–1′ wide; heads numerous, globose, short-peduncled, ½′–1′ broad, nodding after or during flowering; rays 6–10, short (3″–6″), or none; involucre depressed-hemispheric, its outer bracts commonly ciliate, often large, foliaceous and much exceeding the broad, yellowish-margined membranous inner ones; achenes cuneate, about 2″ long, retrorsely hispid on the margins; pappus of 2–4 (usually 4), downwardly barbed awns.

In wet soil, Nova Scotia to Hudson Bay and British Columbia, south to Virginia, Missouri and California. Also in Europe and Asia. Called also Water Agrimony, Double-tooth. July–Oct.

3. Bidens connàta Muhl. Purple-stemmed Swamp Beggar-ticks. (Fig. 3940.)

B. connata Muhl.; Willd. Sp. Pl. 3: 1718. 1804.

Annual; glabrous throughout; stem erect, usually much branched, 6′–8° high, purple. Leaves petioled, lanceolate or oblong-lanceolate, sharply and coarsely serrate, apex acuminate, base tapering, thin, 2′–5′ long, ¼′–1′ wide, the uppermost sometimes sessile, nearly entire and acutish, the lower sometimes with a pair of lateral basal lobes, decurrent on the petiole; heads several or numerous, peduncled, ½′–1½′ broad; involucre campanulate or hemispheric, its outer bracts ciliate or naked, somewhat exceeding the ovate-oblong, inner ones; rays none, or 1–5 and inconspicuous; disk-flowers orange; stamens often exserted; achenes cuneate or obovate, hairy and tubercled, or nearly glabrous, often keeled, the margins with either erect or retrorse hairs, or both, the 2–4 pappus-awns downwardly barbed.

In swamps or moist soil, Nova Scotia to the Northwest Territory, south to Delaware, Georgia, Kentucky and Missouri. Called also Cuckold, Harvest Lice. Aug.–Oct.

4. Bidens comòsa (A. Gray) Wiegand. Leafy-bracted Tickseed. (Fig. 3941.)

B. connata var. *comosa* A. Gray, Man. Ed. 5, 261. 1867.
B. comosa Wiegand, Bull. Torr. Club, 24: 436. 1897.

Annual, glabrous; stem erect, branched, 6′–4½° high, straw-colored. Leaves short-petioled, lanceolate, coarsely serrate with mostly smaller teeth than in *B. connata*, tapering to each end, the petioles broadly margined; heads several or numerous, ½′ broad, or more; outer bracts of the involucre spatulate or lanceolate, foliaceous, often toothed, 2–4 times as long as the head; corollas mostly 4-lobed, pale greenish yellow; stamens and style included; achenes larger, 3½″–5½″ long, evenly cuneate, very flat, retrorsely hairy; pappus-awns commonly 3, downwardly barbed.

In wet soil, southern New York and Massachusetts to Illinois. Leaves thicker and paler than in *B. connata*. Aug.–Oct.

5. Bidens bidentoides (Nutt.) Britton. Swamp Beggar-ticks. (Fig. 3942.)

Diodonta bidentoides Nutt. Trans. Am. Phil. Soc. (II) 7: 361. 1841.
Coreopsis bidentoides T. & G. Fl. N. A. 2: 339. 1842.
B. bidentoides Britton, Bull. Torr. Club, 20: 281. 1893.

Closely resembles *B. connata*, glabrous throughout; stem branched, 1°–4° high. Leaves similar, lanceolate, sharply serrate, petioled, or the upper sessile and entire, acuminate at the apex, narrowed at the base; involucre narrowly or becoming somewhat broadly campanulate, its outer bracts linear, foliaceous, not ciliate, usually much exceeding the oblong inner ones; rays none, or rarely present and very short; achenes linear-cuneate, 4″–5″ long, their sides and the 2 slender pappus-awns (rarely with 2 short intermediate awns) upwardly barbed or hispid.

Muddy shores of the Delaware River and Bay in Pennsylvania, New Jersey, Delaware and Maryland. Aug.–Oct.

6. Bidens discoidea (T. &. G.) Britton. Small Beggar-ticks. (Fig. 3943.)

Coreopsis discoidea T. & G. Fl. N. A. 2: 339. 1842.
B. discoidea Britton, Bull. Torr. Club, 20: 281. 1893.

Annual, glabrous, slender, branching, erect, 2′–6° high. Leaves membranous, very slender-petioled, all the lower ones divided into 3 lanceolate or oblong-lanceolate, dentate, acuminate segments which are 1′–3′ long; uppermost leaves commonly rhombic-lanceolate and undivided; heads usually numerous, slender-peduncled, 2″–5″ broad and about as high; involucre broadly campanulate or hemispheric, its outer bracts usually foliaceous and obtuse, usually much surpassing the inner ones; rays apparently always wanting; achenes flat, narrowly cuneate, upwardly strigose, about 2″ long; pappus of 2 short, upwardly hispid, rarely downwardly barbed awns.

In swamps and wet places, Connecticut to Virginia, Ohio, Michigan, Louisiana and Texas. July–Sept.

7. Bidens frondosa L. Beggar-ticks. Stick-tight. (Fig. 3944.)

Bidens frondosa L. Sp. Pl. 832. 1753.

Annual; stem erect, branched, sparingly pubescent, or glabrous, often purplish, 2°–9½° high. Leaves thin, but not membranous, slender-petioled, pinnately 3–5-divided or the uppermost undivided, the segments lanceolate or oblong-lanceolate, sharply serrate, acuminate at the apex, narrowed at the base, usually slightly pubescent beneath, stalked, 2′–4′ long, ½′–1′ wide; heads usually numerous, peduncled, about 6″ high, 5″–10″ broad; involucre campanulate, becoming hemispheric, its outer bracts more or less foliaceous, often much exceeding the ovate-lanceolate, scarious-margined inner ones; rays none, or rudimentary and inconspicuous; achenes flat, oval or obovate, ciliate, the two slender awns downwardly barbed, or sometimes upwardly hispid.

In moist soil, often a weed in fields, Nova Scotia to Florida, British Columbia, Nebraska and Texas. Introduced as a weed into southern Europe. Called also Rayless Marigold, Beggar-lice, Pitchforks, Stick-seed, Common Bur-marigold. July–Oct.

8. Bidens bipinnàta L. Spanish Needles. (Fig. 3945.)

Bidens bipinnata L. Sp. Pl. 832. 1753.

Annual; stem quadrangular, erect, freely branched, rather slender, 1°–5° high. Leaves thin, acuminate, petioled, 1–3-pinnately dissected into ovate or oblong, toothed or lobed segments, the lower often 8′ long; heads usually numerous, long-peduncled, 2″–4″ broad; involucre narrow, its outer bracts linear, ascending, nearly as long as the broader erect inner ones; rays 3–4, yellow, short, sometimes none; achenes linear, 4-angled, slightly pubescent, narrowed upward into a beak, 5″–9″ long, the outer ones commonly shorter and thicker than the inner; pappus of 2–4 (usually 4), downwardly barbed, slightly spreading awns, much shorter than the achene.

In various situations, often a weed in cultivated fields, Rhode Island to Florida, west to Ohio, Nebraska and Arizona. Also in Mexico and tropical America and introduced as a weed into southern Europe and Asia. July–Oct.

9. Bidens coronàta (L.) Fisch. Southern Tickseed-Sunflower. (Fig. 3946.)

Coreopsis coronata L. Sp. Pl. Ed. 2, 1281. 1763.
Coreopsis aurea Ait. Hort. Kew. 3: 252. 1789.
Bidens coronata Fisch.; Steudel, Nom. Ed. 2, 202. 1840.

Annual, glabrous or nearly so throughout; stem branched, 1°–3° high. Lower leaves petioled, 3′–5′ long, 3-divided, the terminal segment lanceolate, acute or acuminate, serrate, much larger than the serrate or entire lateral ones; upper leaves much smaller, 3-parted, 3-lobed or undivided, sessile or short-petioled, entire or serrate; heads numerous, slender-peduncled, 1′–2′ broad; involucre hemispheric, its outer bracts linear-oblong, obtuse, equalling or slightly exceeding the broader inner ones; rays 6–10, obtuse; achenes broadly cuneate, slightly pubescent, 1″–2″ long; pappus of 2 chaffy divergent somewhat laciniate teeth, rarely with 2 shorter intermediate ones.

In wet places, Virginia (according to Gray), to Florida and Alabama. July–Sept.

10. Bidens trichospérma (Michx.) Britton. Tall Tickseed-Sunflower. (Fig. 3947.)

C. trichosperma Michx. Fl. Bor. Am. 2: 139. 1803.
B. trichosperma Britton, Bull. Torr. Club, 20: 281. 1893.

Annual or biennial, glabrous; stem tall, obscurely quadrangular, much branched, 2°–5° high. Lower leaves petioled, 4′–8′ long, pinnately divided into 5–7 lanceolate acuminate, sharply serrate, incised or nearly entire, sessile or short-stalked segments; upper leaves sessile or nearly so, 3-lobed, 3-divided, or entire and linear-lanceolate; heads numerous, 1½′–2½′ broad, long-peduncled; involucre hemispheric, its outer bracts linear or spatulate, sometimes ciliate, about the length of the broader inner ones; rays 6–19, obtuse, golden yellow, 7″–12″ long; achenes oblong-cuneate, hispid-pubescent and ciliate, 3″–4″ long; pappus of 2 short erect or divergent, upwardly hispid teeth or short awns.

In swamps and wet meadows, Massachusetts to Georgia, Illinois and Kentucky. Aug.–Oct.

Bidens trichospèrma tenuiloba (A. Gray) Britton, Bull. Torr. Club, 20: 281. 1893.
Coreopsis trichosperma var. *tenuiloba* A. Gray, Syn. Fl. 1: Part 2, 295. 1884.

Segments of the leaves linear-lanceolate, serrate or entire; achenes sometimes smaller. In bogs, Illinois, Indiana, Minnesota and southern Ontario. A similar form occurs in southern New Jersey.

11. Bidens aristòsa (Michx.) Britton. Western Tickseed-Sunflower. (Fig. 3948.)

Coreopsis aristosa Michx. Fl. Bor. Am. 2: 140. 1803.
C. aristata Muhl.; Willd. Sp. Pl. 3: 2253. 1804.
B. aristosa Britton, Bull. Torr. Club, 20: 281. 1893.

Annual or biennial; stem much branched, 1°–3° high. Leaves thin, slender-petioled, pubescent beneath, the lower ones pinnately 5–7-divided, 3′–6′ long, the segments lanceolate, serrate, incised or pinnatifid, acuminate, narrowed at the base; upper leaves less divided, lanceolate, or merely lobed, sessile or short-petioled; heads numerous, slender-peduncled, 1′–2′ broad; outer bracts of the hemispheric involucre linear or spatulate, usually ciliate, not surpassing the inner; rays 6–9, obtuse; achenes very flat, oblanceolate or obovate, upwardly ciliate and strigose-pubescent; pappus of 2 slender upwardly or downwardly barbed awns, nearly as long as the achene, rarely wanting.

In swamps and wet prairies, Illinois to Michigan, south to Louisiana and Missouri. Aug.–Oct.

12. Bidens involucràta (Nutt.) Britton. Long-bracted Tickseed-Sunflower. (Fig. 3949.)

Coreopsis involucrata Nutt. Journ. Phil. Acad. 7: 74. 1834.
Bidens involucrata Britton, Bull. Torr. Club, 20: 281. 1893.

Similar to the two preceding species, minutely pubescent, 1°–3° high, much branched. Segments of the leaves narrower, linear-lanceolate, incised or pinnatifid, long-acuminate; heads numerous, 1′–2′ broad, on slender usually hispid peduncles; outer bracts of the hemispheric involucre linear-lanceolate, acuminate, densely hispid and ciliate, much exceeding the inner ones; rays orange at the base; achenes flat, ciliate and strigose; pappus of 2 short teeth.

In swamps, Illinois to Kansas, Arkansas and Texas. July–Sept.

13. Bidens Béckii Torr. Water Marigold. (Fig. 3950.)

Bidens Beckii Torr.; Spreng. Neue Entdeck. 2: 135. 1821.

Perennial, aquatic; stems simple, or little branched, 2°–8° long. Submersed leaves sessile, 1′–2′ long. repeatedly divided into numerous capillary segments; emersed leaves few, sessile, opposite, or sometimes in 3's, lanceolate or oblong, acute, serrate or laciniate, ½′–1½′ long; heads solitary or few, short-peduncled, 1′–1½′ broad; involucre hemispheric, its bracts oval or oblong, obtusish, glabrous, the outer somewhat shorter than the inner; rays 6–10, obovate, or oblong, obtuse, golden yellow; achenes nearly terete, each end truncate; pappus of 3–6 slender awns, downwardly barbed above, smooth below, divergent, 6″–12″ long.

In ponds and streams, Quebec to New Jersey, west to Manitoba and Missouri. Aug.–Sept.

68. THELESPÉRMA Less. Linnaea, 6: 511. 1831.

Glabrous annual or perennial herbs, with opposite linear and undivided, or finely dissected leaves, and long-peduncled heads of both tubular and radiate flowers, or the rays wanting. Involucre hemispheric or campanulate, of 2 distinct series of bracts, the outer short, narrow and somewhat spreading, the inner united nearly to or beyond the middle into a cup, their tips scarious-margined. Receptacle flat, chaffy, the 2-nerved broad white scarious chaff subtending the disk-flowers and achenes. Ray-flowers, when present, neutral, the rays yellow, entire or toothed. Disk-flowers perfect, fertile, their corolla with a slender tube and 5-toothed limb. Anthers obtuse and entire at the base. Style-tips acute. Achenes, some or all of them, papillose on the back, oblong or linear, slightly compressed or terete, wingless. Pappus of 2 retrorsely hispid awns or scales, or sometimes none. [Greek, nipple-seed.]

About 7 species, natives of the south central United States, Mexico and southern South America.

Rays large; pappus-awns shorter than the width of the achene.
Leaves not rigid, their segments filiform-linear; annual or biennial. 1. *T. ambiguum.*
Leaves rigid, their segments linear; perennial. 2. *T. trifidum.*
Rays inconspicuous, or none; awns longer than the width of the achene. 3. *T. gracile.*

1. Thelesperma trífidum (Poir.) Britton. Fine-leaved Thelesperma. (Fig. 3951.)

Coreopsis trifida Poir. in Suppl. Lam. Encycl. 2: 353. 1811.
Thelesperma filifolium A. Gray, Kew Journ. Bot. 1: 252. 1849.
Thelesperma trifidum Britton, Trans. N. Y. Acad. Sci. 9: 182. 1890.

Annual or biennial; stem branched, 1°–3° high. Leaves numerous, not rigid, 1½′–2′ long, bipinnately divided into filiform or linear-filiform segments; heads several or numerous, 12″–15″ broad; outer bracts of the involucre about 8, subulate-linear, equalling or more than half as long as the inner, which are united not higher that the middle; rays 6–10, somewhat spatulate, 3-lobed; disk purple or brown; achenes linear-oblong, straight, or slightly curved, the outer ones strongly papillose; awns of the pappus not longer than the width of the summit of the achene.

In dry soil, Nebraska to Texas. June–Aug.

2. Thelesperma ambíguum A. Gray. Stiff Thelesperma. (Fig. 3952.)

Thelesperma ambiguum A. Gray, Proc. Am. Acad. 19: 16. 1883.

Perennial from a deep woody root and slender rootstocks; stem rigid, usually much branched, 1°–1½° high. Leaves usually numerous, 1½′–2′ long, bipinnately divided into entire rigid linear segments, but less compound than those of the preceding species; outer bracts of the involucre lanceolate-subulate, usually much shorter than the inner ones, which are united to about the middle; rays (rarely wanting) and achenes similar to those of the preceding.

In dry soil, Montana, Colorado and Nebraska to Texas and New Mexico. June–Aug.

3. Thelesperma grácile (Torr.) A. Gray. Rayless Thelesperma. (Fig. 3953.)

Bidens gracilis Torr. Ann. Lyc. N. Y. 2: 215. 1827.
Thelesperma gracile A. Gray, Kew Journ. Bot. 1: 252. 1849.

Perennial from a deep root; stem rigid, branched, 1°–3° high, the branches nearly erect. Leaves rigid, erect or ascending, 2′–3′ long, pinnately or bipinnately divided into linear segments, or the upper linear and entire; heads 6″–10″ broad; rays usually none, sometimes present and 2″–3″ long; outer bracts of the involucre 4–6, oblong or ovate, mostly obtuse, very much shorter than the inner ones which are united to the middle or beyond; disk yellow or brownish; outer achenes slightly papillose; pappus-awns longer than the width of the summit of the achene.

On dry plains, Nebraska and Wyoming to Texas, northern Mexico and Arizona. May–Aug.

69. GALINSÒGA R. & P. Prodr. Fl. Per. 110. *pl. 24.* 1794.

Annual branching herbs, with opposite, mostly petioled, deutate or entire leaves, and small peduncled heads of both tubular and radiate flowers, terminal and in the upper axils. Involucre hemispheric or broadly campanulate, its bracts in 2 series, ovate, obtuse, membranous, striate, nearly equal, or the outer shorter. Receptacle conic or elongated, its thin chaff subtending the disk-flowers. Ray-flowers white, pistillate, fertile, the rays 4 or 5, short. Disk-flowers yellow, perfect, the corolla 5-toothed. Anthers minutely sagittate at the base. Style-branches tipped with acute appendages. Achenes angled, or the outer ones flat. Pappus of the disk-flowers of several short laciniate or fimbriate scales, that of the ray-flowers of several or few short slender bristles, or none. [Named in honor of M. M. Galinsoga, superintendent of the Botanic Gardens at Madrid]

About 5 species, natives of tropical and warm temperate America.

1. Galinsoga parviflòra Cav. Galinsoga. (Fig. 3954.)

Galinsoga parviflora Cav. Icon. 3: 41. *pl. 281.* 1794.

Slightly appressed-pubescent, 1°–3° high. Leaves thin, ovate or deltoid-ovate, 3-nerved, 1′–3′ long, acute at the apex, mostly obtuse at the base, dentate, the lower slender-petioled, the upper short-petioled or sessile, and sometimes nearly or quite entire; heads usually numerous, 2″–3″ broad, slender-peduncled; bracts of the involucre glabrous or nearly so, the outer shorter; pappus of the disk-flowers 4–16, oblong to spatulate, fimbriate obtusish scales, shorter than the finely pubescent obpyramidal achene.

In door-yards and waste places, eastern Massachusetts to Oregon, North Carolina, Missouri and Mexico. Naturalized from tropical America. Introduced into Europe as a weed. June–Nov.

Galinsoga parviflòra hispida DC. Prodr. 5: 677. 1836.
Pubescence more abundant, especially above, spreading; pappus of the disk-flowers attenuate, bristle-tipped. In waste places, Rhode Island to Pennsylvania, North Carolina and Wisconsin.

70. ACTINOSPÉRMUM Ell. Bot. S. C. & Ga. 2: 448. 1824.

[Balduina Nutt. Gen. 2: 175. 1818. Not *Baldwinia* Raf. F. 1818.]

Annual or perennial, simple or branched, erect herbs, with alternate entire narrow punctate leaves, and large terminal heads of both tubular and radiate, yellow flowers, or those of the disk purplish. Involucre hemispheric, its small bracts imbricated in several series, appressed, or with spreading tips, the outer shorter. Receptacle convex, deeply honey-combed, chaffy, the persistent chaff coriaceous or cartilaginous, laterally united, subtending the disk-flowers. Rays large, neutral, toothed. Disk-flowers perfect, fertile, the corolla 5-toothed. Anthers sagittate at the base. Style-branches with truncate subulate tips. Achenes turbinate, silky-villous. Pappus of 7–12 scarious nearly equal scales. [Greek ray-seed.]

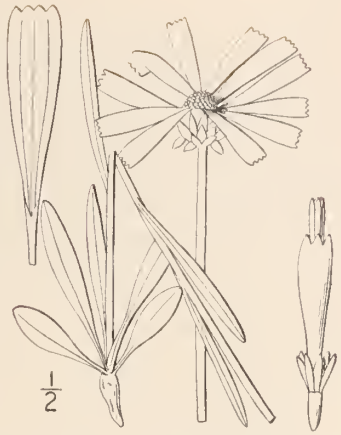
Two known species, natives of the southeastern United States.

1. Actinospermum uniflòrum (Nutt.) Barnhart. One-headed Actinospermum. (Fig. 3955.)

Balduina uniflora Nutt. Gen. 2: 175. 1818.
A. uniflorum Barnhart, Bull. Torr. Club, 24: 411. 1897.

Stem stout, puberulent, simple, or with a few erect branches, 1°–3° high. Leaves thick, spatulate-linear or the upper linear, sessile, erect or ascending, 1′–2′ long, the lower 2″–3″ wide; heads long-peduncled, solitary, 2′–2½′ broad; bracts of the involucre ovate, acuminate, thick, their tips at length spreading; rays 20–30, cuneate, 3–4-toothed at the truncate apex; disk 8″–12″ broad; chaff of the receptacle cuneate, truncate, very cartilaginous, more or less united laterally, the summit eroded; achenes obconic; pappus of 7-9 oblong scales about as long as the achene.

In wet pine-barrens, Virginia (according to Torrey and Gray), North Carolina to Florida and Louisiana. July–Sept.



71. MARSHÁLLIA Schreb. Gen. Pl. 810. 1789.

Perennial, often tufted, simple or branched, nearly glabrous herbs, with basal or alternate, entire leaves, and large long-peduncled discoid heads of purple pink or white, glandular-pubescent flowers. Involucre hemispheric or broadly campanulate, its bracts in 1 or 2 series, herbaceous, narrow, nearly equal. Receptacle convex or at length conic, chaffy, the scales narrow, rigid, distinct. Rays none. Flowers all perfect and fertile, their corollas with a deeply 5-lobed or 5-parted campanulate limb and a slender tube. Anthers minutely sagittate at the base. Style-branches long, truncate. Achenes turbinate, 5-ribbed and 5-angled. Pappus of 5 or 6 acute or acuminate, ovate or lanceolate-deltoid, nearly entire scales. [Named for Humphrey Marshall, of Pennsylvania, botanical author.]

Four known species, natives of the southern and central United States.

Leaves ovate or oval, or oval-lanceolate, thin, 3-nerved. 1. *M. trinervia.*
Leaves linear, or the basal spatulate, thick. 2. *M. caespitosa.*

1. Marshallia trinérvia (Walt.) Porter. Broad-leaved Marshallia. (Fig. 3956.)

Athanasia trinervia Walt. Fl. Car. 201. 1788.
Marshallia latifolia Pursh, Fl. Am. Sept. 519. 1814.
Marshallia trinervia Porter, Mem. Torr. Club, 5: 337. 1894.

Stem simple, or little branched, leafy to or beyond the middle, 1°–2° high. Leaves thin, those of the stem ovate, oval, or ovate-lanceolate, 3-nerved, acute or acuminate at the apex, narrowed to a sessile base, 2′–3′ long, 9″–18″ wide; heads ½′–1′ broad, corolla purplish; bracts of the involucre linear-lanceolate, acute, rigid; chaff of the receptacle subulate-filiform; pappus-scales lanceolate-acuminate from a triangular base; achenes glabrous when mature.

In dry soil, Virginia to Alabama and Mississippi. May–June.

2. Marshallia caespitòsa Nutt. Narrow-leaved Marshallia. (Fig. 3957.)

Marshallia caespitosa Nutt.; DC. Prodr. 5: 680. 1836.

Stems usually tufted and simple, sometimes sparingly branched, leafy either only near the base or to beyond the middle, 8′–15′ high. Leaves thick, faintly 3-nerved, the basal ones spatulate, or linear-spatulate, obtuse, those near the base usually much longer and linear, sometimes 4′ long and 3″ wide, the upper ones linear, acutish, shorter; head about 1′ broad, borne on a peduncle often 10′ long, corollas pale rose or white; bracts of the involucre linear-lanceolate, acute or acutish; chaff of the receptacle linear, or slightly dilated above; achenes villous on the angles; scales of the pappus ovate, acutish, equalling or longer than the achene.

In dry soil, Kansas to Texas. May–June.

72. PSILÓSTROPHE DC. Prodr. 7: 261. 1838.

[RIDDELLIA Nutt. Trans. Am. Phil. Soc. (II) 7: 371. 1841.]

Branched annual or perennial woolly herbs, often nearly glabrous when old, with alternate leaves, and middle-sized heads of both tubular and radiate yellow flowers, corymbose, or clustered at the ends of the branches. Involucre cylindraceous, its bracts 4–10 in 1 series, narrow, equal, densely white-woolly, separate, but erect and connivent, commonly with 1–4 scarious ones within, and occasionally a narrow outer one. Rays broad, becoming papery and whitish, persistent, 5–7-nerved, 2–3-toothed, pistillate. Receptacle small, naked. Disk-flowers perfect, fertile, their corollas with a short proper tube and elongated cylindraceous limb, 5-toothed, the teeth glandular-bearded. Anthers obtuse and entire at the base. Style-branches of the disk-flowers capitellate. Achenes linear, striate. Pappus of 4–6 nerveless acute scales, glabrous or villous.

Three species, natives of the southwestern United States and northern Mexico.

1. Psilostrophe Tagètinae (Nutt.) Kuntze. Psilostrophe. (Fig. 3958.)

Riddellia Tagetinae Nutt. Trans. Am. Phil. Soc. (II) 7: 371. 1841.
Psilostrophe Tagetinae Kuntze, Rev. Gen. Pl. 358. 1891.

Perennial, branched, 6′–2° high, loosely white-woolly, or at length glabrous. Basal and lower leaves spatulate, entire, dentate or rarely pinnatifid, mostly obtuse, 2′–4′ long; upper leaves sessile, or nearly so, smaller, linear, or spatulate, usually entire; heads several together in the clusters, ½′–1′ broad, short-peduncled; rays few, commonly as wide as long, with 2 or 3 broad teeth or lobes at the summit; achenes glabrous, or sparingly pubescent; pappus-scales linear-lanceolate to oblong-lanceolate, glabrous, shorter than the disk-corollas.

In dry sandy soil, Kansas and Colorado to Texas and Arizona. June–Sept.

73. FLAVÈRIA Juss. Gen. Pl. 186. 1789.

Glabrous or minutely puberulent, light-green, mostly annual herbs, with opposite sessile entire or serrate leaves, and small 1-several-flowered, usually sessile, oblong and densely cymose-capitate heads of tubular, or both tubular and radiate yellow or yellowish flowers. Involucre of 2–5 narrow, nearly equal, appressed bracts, sometimes with 1 or 2 additional small exterior ones. Receptacle small, naked. Ray-flower commonly 1, pistillate, fertile, sometimes wanting. Disk-flowers 1–15, perfect, fertile, their corollas 5-toothed. Anthers entire at the base. Style-branches of the disk-flowers truncate. Achenes oblong or linear-oblong, 8–10-ribbed. Pappus none. [Latin, *flavus*, yellow, from its dyeing properties.]

About 7 species, natives of the warmer parts of America. In addition to the following, 3 others occur in the southern United States.

1. Flaveria angustifòlia (Cav.) Pers. Narrow-leaved Flaveria. (Fig. 3959.)

Milleria angustifolia Cav. Icon. 3: 12. *pl. 223.* 1794.
Flaveria angustifolia Pers. Syn. 2: 489. 1807.

Annual, glabrous or very nearly so, erect, 1°–2° high, little branched. Leaves linear or lanceolate, serrulate or entire, 3-nerved, acuminate or acute at the apex, sessile by a broad and somewhat clasping base, 1′–2½′ long, 2″–4″ wide; heads about 3″ high, closely sessile in terminal glomerules or these pedunculate from the upper axils; involucre usually of 3 oblong-lanceolate bracts, 2–5-flowered; ray equalling or longer than the breadth of the disk; achenes linear, glabrous, about 1½″ long.

In alkaline soil, Kansas and Colorado to Texas, Mexico and New Mexico. Aug.–Oct.

74. HYMENOPÁPPUS L'Her.; Michx. Fl. Bor. Am. 2: 103. 1803.

Perennial or biennial, erect herbs, with angled stems, alternate or basal, mostly pinnatifid or dissected leaves, and corymbose or solitary, small or rather large discoid heads, of white or yellow flowers. Involucre hemispheric or broadly campanulate, its bracts 6–12 in 1 or 2 series, nearly equal, mostly appressed, colored, petal-like, the margius and apices scarious. Receptacle small, naked. Rays none. Disk-flowers all perfect and fertile, their corollas with slender tubes and reflexed or spreading campauulate 5-lobed limbs, the lobes ovate. Anthers entire at the base. Style-branches with short conic appendages. Achenes obovoid or obpyramidal, 4–5-angled, the faces usually prominently 1–3-nerved. Pappus of 10–20 thin obtuse scales, sometimes very short or none. [Greek, membrane-pappus.]

About 7 species, natives of southern and central North America and Mexico.

Bracts of the involucre broadly ovate or oval, bright white. 1. *H. Carolinensis.*
Bracts obovate to oblong, green or with white tips.
  Heads numerous, 4″–6″ broad; biennials.
    Achenes puberulent; corolla white. 2. *H. corymbosus.*
    Achenes densely villous.
      Plant glabrate, or loosely woolly; corolla dull white. 3. *H. tenuifolius.*
      Plant densely white-woolly; corolla yellow. 4. *H. flavescens.*
  Heads few, 6″–12″ broad; corolla yellow; perennial. 5. *H. filifolius.*

1. Hymenopappus Carolinénsis (Lam.) Porter. White-bracted Hymenopappus. (Fig. 3960.)

Rothia Carolinensis Lam. Journ. Hist. Nat. 1: 16. *pl. 1.* 1792.
Hymenopappus scabiosaeus L'Her.; Michx. Fl. Bor. Am. 2: 104. 1803.
Hymenopappus Carolinensis Porter, Mem. Torr. Club, 5: 338. 1894.

Biennial: stem woolly-pubescent or glabrate, leafy below, corymbosely branched and nearly naked above, 2°–3° high. Basal and lower leaves petioled, 4′–6′ long, 1–2-pinnately parted or deeply piunatifid into linear or oblong, obtuse or obtusish lobes, more or less white-tomentose beneath, green and glabrate above; upper leaves few, smaller, sessile, less divided; heads commonly numerous, corymbose, 6″–10″ broad; bracts of involucre oblong, ovate or oval, sometimes slightly obovate, thin, bright white, puberulent or glabrate; corolla-lobes about as long as the throat, white; achenes puberulent or pubescent; pappus of very small nerveless scales, shorter than the width of the top of the achene.

In dry sandy soil, Illinois to Texas, east to South Carolina and Florida. March–June.

2. Hymenopappus corymbòsus T. & G. Corymbed, or Smooth White Hymenopappus. (Fig. 3961.)

Hymenopappus corymbosus T. & G. Fl. N. A. 2: 372. 1842.

Biennial; stem glabrous, or nearly so, corymbosely branched and nearly naked above, 1°–2° high. Lower and basal leaves petioled, 1–2-pinnately parted into linear or nearly filiform, acute or acutish glabrous lobes, or somewhat tomentose beneath; upper leaves few, much smaller and less divided, or the uppermost reduced to linear scales; heads corymbose, numerous, 4″–6″ broad; bracts of the involucre obovate to oblong, puberulent, their tips greenish white; corolla white, its lobes about as long as the throat; achenes puberulent; pappus-scales small, nerveless, shorter than the width of the top of the achene.

On dry prairies, Nebraska to Texas. Summer.

3. Hymenopappus tenuifòlius Pursh. Woolly White Hymenopappus. (Fig. 3962.)

Hymenopappus tenuifolius Pursh, Am. Sept. 742. 1814.

Biennial; stem lightly tomentose, or at length glabrate, 1°–2° high, slender, leafy below, corymbosely branched and nearly naked above. Lower and basal leaves petioled, 1–3-pinnately parted into linear or filiform lobes, woolly pubescent beneath, at least when young; upper leaves much smaller and less compound; heads numerous, corymbose, 4″–6″ broad; bracts of the involucre obovate-oblong, usually densely tomentose; corolla white, its lobes slightly shorter than the throat; achenes densely villous-pubescent; pappus of several oblong to ovate, ribbed or nerved scales, which are about as long as the width of the top of the achene.

On dry prairies, Nebraska to Texas. June–Sept.

4. Hymenopappus flavéscens A. Gray. Woolly Yellow Hymenopappus. (Fig. 3963.)

Hymenopappus flavescens A. Gray, Mem. Am. Acad. (II) 4: 97. 1849.

Biennial; stem densely white-woolly, at least when young, 1°–2½° high, leafy, branched above. Leaves 1–3-pinnately parted or divided into linear segments; heads numerous, usually larger than those of the preceding species; involucral bracts obovate to ovate with greenish white margins; corolla yellow or yellowish, the lobes about equalling the throat, achenes short-villous; pappus-scales spatulate, shorter than the slender corolla-tube.

In sandy soil, Kansas to Texas, Arizona and northern Mexico.

5. Hymenopappus filifòlius Hook. Low Tufted Hymenopappus. (Fig. 3964.)

Hymenopappus filifolius Hook. Fl. Bor. Am. 1: 317. 1833.

Perennial from a deep woody root; stems usually tufted, woolly when young, sometimes glabrate when old, densely leafy toward the base, usually naked or nearly so and sparingly branched above, 6′–18′ high. Leaves tomentose when young, the lower and basal ones petioled, 1–3-pinnately parted or pinnatifid into narrowly linear, somewhat rigid lobes; heads commonly few, 6″–12″ broad; bracts of the involucre obovate-oblong, usually densely woolly, their tips whitish; corolla yellow or yellowish, its lobes much shorter than the throat; achenes densely villous; pappus-scales costate, short.

On prairies and in dry rocky soil, Northwest Territory to Nebraska and Arizona. June–Sept.

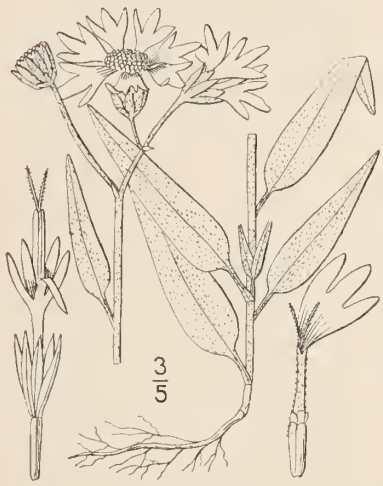
75. POLÝPTERIS Nutt. Gen. 2: 139. 1818.

Erect rough, glandular or cinereous, branching herbs, with alternate, mostly entire leaves, or the lower opposite, and corymbose heads of tubular or both tubular and radiate pink or purple flowers. Involucre campanulate or obconic, its bracts in 1 or 2 series, narrow, herbaceous, nearly equal, or with a few exterior shorter ones, appressed, usually colored. Receptacle small, flat, naked. Ray-flowers, when present, pistillate, fertile, the rays 3-cleft. Disk-flowers perfect, fertile, their corollas with slender tubes and deeply 5-parted campanulate limbs. Anthers entire or emarginate at the base. Style-branches filiform, acutish, glandular-pubescent throughout. Achenes linear or narrowly obpyramidal, quadrangular. Pappus of 8–12 lanceolate strongly costate scales, that of the outer achenes often much shorter. [Greek, many-winged.]

About 6 species, natives of the southern and south-central United States and Mexico.

Rays purple, deeply 3-lobed; leaves lanceolate. 1. *P. Hookeriana.*
Rays none; leaves linear. 2. *P. callosa.*

1. Polypteris Hookeriàna (T. & G.) A. Gray. Hooker's Polypteris. (Fig. 3965.)



Stevia sphacelata Nutt.; Torr. Ann. Lyc. N. Y. 2: 214. Without description. 1827.
Palafoxia Hookeriana T. & G. Fl. N. A. 2: 368. 1842.
Polypteris Hookeriana A. Gray, Proc. Am. Acad. 19: 31. 1883.

Annual; stem rather stout, glandular-pubescent and viscid above, 1°–3° high. Leaves lanceolate, entire, acute or acuminate, narrowed at the base, rough on both sides, the upper alternate, the lower opposite and slender-petioled, 2′–4′ long, 3″–5″ wide; bracts of the involucre 10–16, linear-lanceolate or spatulate, glandular-hispid, the inner with purplish tips; ray-flowers 8–10; rays rose-purple, deeply 3-cleft, sometimes small, or none; achenes about 4″ long and ½″ thick; pappus-scales of the disk-flowers 6–8, lanceolate, awned, more than half the length of the achene, those of the ray-flowers as many, spatulate, obtuse, shorter.

In dry soil, Nebraska to Texas and Mexico. July–Sept.

2. Polypteris callòsa (Nutt.) A. Gray. Rayless Polypteris. (Fig. 3966.)

Stevia callosa Nutt. Journ. Acad. Phila. 2: 121. 1821.
Polypteris callosa A. Gray, Proc. Am. Acad. 19: 30. 1883.

Annual, glandular, at least above; stem slender, paniculately branched, 1°–2° high. Leaves linear, or linear-lanceolate, 1′–2½′ long, 1″–2½″ wide, entire, short-petioled, mostly alternate; heads discoid; bracts of the top-shaped involucre 8–10, linear or narrowly oblong, herbaceous, pubescent, about ¼′ long; corollas purple, deeply 5-parted; achenes narrowly obpyramidal, pubescent or glabrous, nearly as long as the involucre; pappus-scales obovate or nearly orbicular, rounded, or retuse, or sometimes minute, or none.

In dry soil, Missouri to Texas and New Mexico. June–Oct.

76. BÀHIA Lag. Gen. et Sp. Nov. 30. 1816.

Herbs or shrubs, more or less woolly, with opposite or alternate leaves, and small or rather large, corymbose or solitary heads, of both tubular and radiate, yellow flowers. Involucre campanulate or hemispheric, its bracts in 1 or 2 series, herbaceous, obtuse, appressed, nearly equal. Receptacle small, nearly flat, naked, foveolate. Ray-flowers in 1 series, pistillate, fertile. Disk-flowers perfect, fertile, their corollas with campanulate or cylindric,

5-cleft limb. Anthers entire or emarginate at the base. Style-tips mostly truncate and obtuse. Achenes quadrangular, linear or oblong. Pappus of several nerveless or costate scales, rarely none. [Named for J. F. Bahi, Professor of Botany at Barcelona.]

About 16 species, natives of western North America, Mexico and Chile. Besides the following, some 10 others occur in the western parts of North America.

1. Bahia oppositifòlia Nutt. Bahia. (Fig. 3967.)

Trichophyllum oppositifolium Nutt. Gen. 2: 167. 1818.
Bahia oppositifolia Nutt.; T. & G. Fl. N. A. 2: 376. 1842.

Perennial, herbaceous; stem densely cinereous, much branched, 4′–12′ high, very leafy. Leaves opposite, or the uppermost alternate, ½′–1½′ long, palmately 2–5-parted into linear, obtuse or obtusish, entire segments, finely cinereous on both sides; heads short-peduncled, 6″–9″ broad; involucre campanulate, or becoming hemispheric, its bracts oblong, obtuse, densely tomentose; rays 5–7, short; achenes linear-oblong, glandular-pubescent; pappus of 4–8 spatulate to lanceolate scales with thickened bases.

On plains, Nebraska and Montana to New Mexico. June–Sept.

77. PICRADÈNIA Hook. Fl. Bor. Am. 1: 317. 1833.

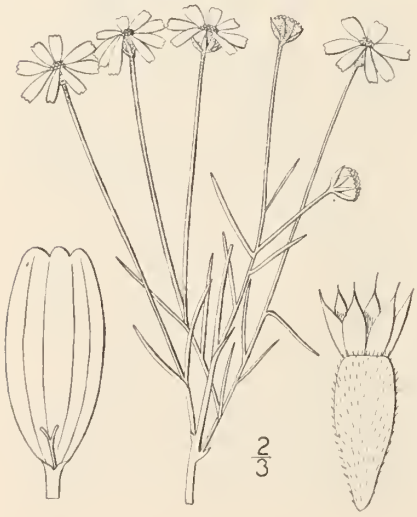
[Actinella Nutt. (1818), not Pers. (1807) nor *Actinea* Juss. (1803).]

Branched or scapose, villous-pubescent or glabrous, bitter and aromatic herbs, with alternate or basal, often punctate leaves, and small or rather large, peduncled heads of both tubular and radiate, yellow flowers, or rays rarely wanting. Involucre hemispheric, campanulate or depressed, its bracts imbricated in 2–3 series, appressed, the outer ones sometimes united at the base. Receptacle convex or conic, naked. Ray-flowers pistillate and fertile, the rays 3-toothed, 3-lobed Disk-flowers perfect, fertile, their corollas with 4–5-toothed limbs. Anthers entire or minutely sagittate at the base. Style-branches truncate and penicillate at the summit. Achenes turbinate, 5–10-ribbed or angled, villous or pubescent. Pappus of 5–12 thin aristate acuminate or truncate scales. [Greek, bitter glands.]

About 20 species, natives of western North America and Mexico. Besides the following, some 11 others occur in the western and southwestern parts of the United States.

Leaves entire; bracts of the involucre distinct to the base.
- Stem leafy, branching; stem-leaves linear. 1. *P. linearifolia.*
- Stems tufted, simple, scapose; leaves basal.
  - Leaves linear or narrowly spatulate, glabrous or slightly villous. 2. *P. scaposa.*
  - Leaves spatulate, mostly densely silky-villous. 3. *P. acaulis.*

Leaves 1–3-parted into filiform segments; outer bracts connate. 4. *P. odorata.*



1. Picradenia linearifòlia (Hook.) Britton. Fine-leaved Picradenia. (Fig. 3968.)

Hymenoxys linearifolia Hook. Icon. *pl. 146.* 1837.
Actinella linearifolia T. & G. Fl. N. A. 2: 383. 1842.

Annual or perhaps biennial; stem usually diffusely branched, finely hirsute, or glabrous, or woolly at the base, slender, 6′–15′ high. Stem-leaves narrowly linear, sessile, ½′–1½′ long, ½″–1″ wide; basal leaves spatulate, often villous, much broader, obtuse, narrowed into margined petioles; heads numerous, slender-peduncled, 6″–8″ broad; involucre broadly campanulate, its bracts oblong, obtuse, pubescent, distinct to the base, imbricated in about 2 series; receptacle conic; rays 6–10, oblong; achenes pubescent; pappus of 5 or 6 ovate awned scales.

In dry soil, Kansas to Louisiana, Texas and New Mexico. May–Sept.

2. Picradenia scapòsa (DC.) Britton. Dotted Picradenia. (Fig. 3969.)

Cephalophora scaposa DC. Prodr. 5: 663. 1836.
Actinella scaposa Nutt. Trans. Am. Phil. Soc. (II.) 7: 379. 1841.

Perennial by thick roots and a slender branching caudex; scapes tufted, slender, monocephalous, pubescent or glabrate, sometimes woolly below, 6′–15′ high. Leaves all basal, or near the base, linear or narrowly spatulate, entire (rarely somewhat cleft), glabrous, or slightly villous, conspicuously punctate, 1′–2½′ long, 1″–2½″ wide; heads 1′–1½′ broad; involucre nearly hemispheric, its bracts often obtuse, densely tomentose; rays 12–20; pappus of about 5 ovate or oblong awned scales.

In dry soil, Nebraska to Texas, Mexico and New Mexico. May–Nov.

3. Picradenia acaùlis (Nutt.) Britton. Stemless Picradenia. (Fig. 3970.)

Actinella acaulis Nutt. Gen. 2: 173. 1818.

Similar to the preceding species, perennial from thick roots and a stout branched caudex; scapes tufted, rather stout, or slender, densely silky or tomentose, 2′–8′ high. Leaves all borne on the ends of the branches of the caudex, spatulate, entire, obtuse or obtusish, 1′–2′ long, 1½″–3″ wide, densely silky or villous; heads 9″–18″ broad; involucre hemispheric, its bracts densely villous; rays 10–15; pappus of 5 or 6, ovate or oblong, awned scales.

In dry or rocky soil, Northwest Territory to Montana, Nebraska, Arizona and New Mexico. May–Aug.

4. Picradenia odoràta (DC.) Britton. Fragrant Picradenia. Limonillo. (Fig. 3971.)

Hymenoxys odorata DC. Prodr. 5: 661. 1836.
Actinella odorata A. Gray, Mem. Am. Acad. (II.) 4: 101. 1849.

Annual; stem much branched, puberulent, sparingly hirsute or glabrous, 1°–2° high, leafy. Leaves 1′–2′ long, 1–3-parted into filiform entire somewhat pubescent segments about ½″ wide; heads commonly numerous, 6″–10″ broad; involucre campanulate, puberulent, its outer bracts 6–9, lanceolate, keeled, acute, united at the base; rays 7–10, cuneate; pappus-scales lanceolate, acuminate.

In dry soil, Kansas to Texas, Mexico and southern California. April–July.

78. HELÈNIUM L. Sp. Pl. 886. 1753.

Erect, mostly branching herbs, with alternate, mainly decurrent, punctate bitter entire or dentate leaves, and large peduncled heads of both tubular and radiate, yellow or brownish-yellow flowers, or rays sometimes wanting. Involucre broad and short, its bracts in 1 or 2 series, linear or subulate, reflexed or spreading. Receptacle convex, sub-globose or oblong, naked. Ray-flowers pistillate and fertile, or neutral, the rays cuneate, 3–5-lobed. Disk-flowers perfect, fertile, their corollas 4–5-toothed, the teeth glandular-pubescent. Anthers 2-toothed or sagittate at the base. Style-branches of the disk-flowers dilated and truncate at the apex. Achenes turbinate, ribbed. Pappus of 5–8 entire, dentate or incised, acuminate or aristate scales. [The Greek name of some plant, from Helenus or Helena.]

About 24 species, natives of North and Central America. In addition to the following, some 18 others occur in the southern and southwestern parts of the United States.

Stem-leaves oblong-lanceolate or ovate-lanceolate, dentate; rays fertile; disk yellow.
1. *H. autumnale.*

Stem-leaves lanceolate or linear-lanceolate, mainly entire; rays neutral; disk purple.
2. *H. nudiflorum.*

Leaves all linear-filiform, entire; rays fertile.
3. *H. tenuifolium.*

1. Helenium autumnàle L. False or Swamp Sunflower. Sneezeweed. (Fig. 3972.)

Helenium autumnale L. Sp. Pl. 886. 1753.

Perennial; stem puberulent or glabrous, rather stout, narrowly winged by the decurrent bases of the leaves, corymbosely branched above, 2°–6° high. Leaves firm, oblong, lanceolate or ovate-lanceolate, acuminate or acute at apex, narrowed to the sessile base, pinnately few-veined, 2′–5′ long, ¼′–2′ wide, dentate or denticulate, puberulent or glabrous, bright green; heads numerous, 1′–2′ broad, borne on long puberulent peduncles; bracts of the flattish involucre densely canescent; rays 10–18, drooping, bright yellow, equalling or longer than the globose yellow disk, pistillate and fertile, 3-cleft; achenes pubescent on the angles; pappus-scales ovate, acuminate or aristate, often lacerate or toothed.

In swamps and wet meadows, Quebec to Florida, west to the Northwest Territory and Arizona. Called also Yellow-star, Ox-eye. Ascends to 2600 ft. in Virginia. Aug.–Oct.

Helenium autumnàle pubéscens (Ait.) Britton, Mem. Torr. Club, 5: 339. 1894.
Helenium pubescens Ait. Hort. Kew. 3: 287. 1789.

Leaves pale, pubescent, or densely canescent beneath. Minnesota to British Columbia, Nebraska and Texas.

2. Helenium nudiflòrum Nutt. Purple-head Sneezeweed. (Fig. 3973.)

Helenium nudiflorum Nutt. Trans. Am. Phil. Soc. (II.) 7: 384. 1841.
Leptopoda brachypoda T. & G. Fl. N. A. 2: 388. 1842.

Perennial; stem mostly slender, puberulent at least above, corymbosely branched near the summit, 1°–3° high, narrowly winged by the decurrent leaf-bases. Stem-leaves lanceolate or linear-lanceolate, entire or sparingly denticulate, acute or obtusish at the apex, 1½′–3′ long, 2″–6″ wide, sessile; basal and lower leaves spatulate, obtuse, more or less dentate, tapering into margined petioles; heads several or numerous, 1′–1½′ broad, on slender or short-puberulent peduncles; rays 10–15 (sometimes wanting), drooping, yellow, yellow with a brown base, or brown throughout, 3-toothed, neutral, or with rudimentary pistils, sterile, equalling or exceeding the brown or purple globose disk; pappus-scales ovate, aristate.

In moist soil, Missouri and Illinois to Texas, east to North Carolina and Florida. Also near Philadelphia, where it is apparently naturalized from the south. June–Oct.

3. Helenium tenuifòlium Nutt.

Fine-leaved Sneezeweed. (Fig. 3974.)

Helenium tenuifolium Nutt. Journ. Phil. Acad. 7: 66. 1834.

Annual; glabrous or minutely pubescent above; stem slender, very leafy and usually much branched, 8′–24′ high. Leaves all linear-filiform, entire, sessile, often fascicled, ½′–1½′ long, ½″ or less wide; heads several or numerous, corymbose, 9″–15″ broad, borne on slender or filiform peduncles; bracts of the involucre few, linear or subulate, sometimes pubescent, soon reflexed; rays 4–8, fertile, 3–4-toothed, at length drooping, longer than the globose disk; achenes villous; pappus-scales ovate, tipped with slender awns.

In moist soil, southeastern Virginia to Florida, Missouri, Arkansas and Texas. Aug.–Oct.

79. GAILLÀRDIA Foug. Mem. Acad. Sci. Paris, 1786: 5. *pl. 1, 2.* 1786.

Branching or scapose, more or less pubescent herbs, with alternate or basal leaves, and large peduncled heads of both tubular and radiate flowers, or rays wanting. Involucre depressed-hemispheric, or flatter, its bracts imbricated in 2 or 3 series, their tips spreading or reflexed. Receptacle convex or globose, bristly, fimbrillate or nearly naked. Rays cuneate, yellow, purple, or parti-colored, neutral or rarely pistillate, 3-toothed or 3-lobed. Disk-flowers perfect, fertile, their corollas with slender tubes and 5-toothed limbs, the teeth pubescent with jointed hairs. Anthers minutely sagittate or auricled at the base. Style-branches tipped with filiform or short appendages. Achenes turbinate, 5-ribbed, densely villous, at least at the base. Pappus of 6–12, 1-nerved awned scales, longer than the achene. [Named for M. Gaillard de Marentonneau, a French botanist.]

About 12 species, natives of the south-central part of the United States, and Mexico, 1 in southern South America. All the following called in Texas Blanket-flower.

Stem leafy; style-tips with filiform hispid appendages.
- Fimbrillae of the receptacle obsolete, or short; southern. — 1. *G. lanceolata.*
- Fimbrillae subulate or bristle-like, mostly longer than the achenes.
  - Rays yellow; fimbrillae exceeding the achenes. — 2. *G. aristata.*
  - Rays purple, or red at base; fimbrillae about equalling the achenes. — 3. *G. pulchella.*

Leaves basal; style-tips with short naked appendages; rays none, or few. — 4. *G. suavis.*

1. Gaillardia lanceolàta Michx.

Sweet Gaillardia. (Fig. 3975.)

Gaillardia lanceolata Michx. Fl. Bor. Am. 2: 142. 1803.

Annual, or perhaps perennial; stem puberulent with jointed hairs, or cinereous, usually branched, 1½°–3° high, the branches straight, nearly erect. Stem-leaves sessile, spatulate or linear, entire or sparingly serrate, puberulent, ciliolate, acute or obtusish and mucronulate at the apex, narrowed to the base, 1′–3′ long, 2″–4″ wide; basal leaves broader, very obtuse, sometimes short-petioled; heads 1′–2′ broad, long-peduncled; flowers sweet-scented; bracts of the involucre about equalling the violet disk; rays 8–12, yellow or reddish with darker veins, rarely none; style-tips with filiform hispid appendages; achenes villous at the base, or to beyond the middle; fimbrillae of the receptacle short or none; awns of the pappus slender.

In dry woods, Kansas to Texas, east to South Carolina and Florida. May–Sept.

2. Gaillardia aristàta Pursh. Great-flowered Gaillardia. (Fig. 3976.)

Gaillardia aristata Pursh, Fl. Am. Sept. 573. 1814.

Perennial; stem simple, or little branched, hirsute, or densely pubescent with jointed hairs, 1°–3° high. Leaves firm, densely and finely pubescent, the lower and basal ones petioled, oblong or spatulate, laciniate, pinnatifid or entire, mostly obtuse, 2′–5′ long; upper leaves sessile, lanceolate, or oblong, or slightly spatulate, smaller, entire or dentate, rarely pinnatifid; heads 1½′–4′ broad, long-peduncled; bracts of the involucre lanceolate, acuminate, hirsute; rays 10–18, yellow; style-tips with filiform appendages; fimbrillae of the receptacle mostly longer than the achenes, which are villous at least at the base.

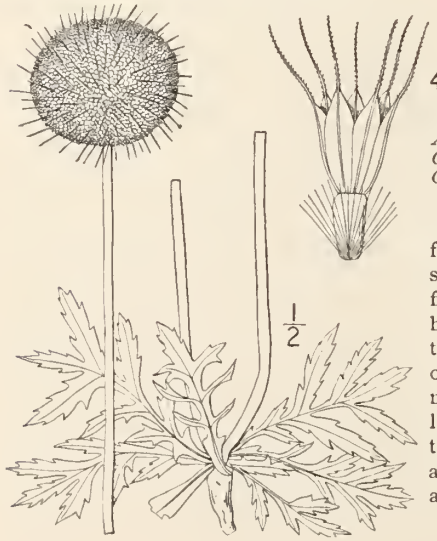
On plains and prairies, Minnesota to the Northwest Territory and British Columbia, south to Colorado and New Mexico. Leaves sometimes all basal. May–Sept.

3. Gaillardia pulchélla Foug. Showy Gaillardia. (Fig. 3977.)

Gaillardia pulchella Foug. Mem. Acad. Sci. Paris, 1786: 5. 1786.

Annual; diffusely branched at the base, the branches ascending, 6′–15′ high, or larger in cultivation, more or less hirsute or pubescent with jointed hairs. Leaves lanceolate, oblong, or the lower spatulate, 1′–3′ long, entire, dentate or sinuate-pinnatifid, all but the lowest sessile; heads 1′–3′ broad, long-peduncled, bracts of the involucre lanceolate, acuminate, hirsute or pubescent; rays 10–20, red or purple at the base, yellow toward the apex; style-tips with filiform hispid appendages; fimbrillae of the receptacle equalling or scarcely longer than the achenes, which are more or less villous, or glabrous.

In dry soil, Nebraska and Missouri to Louisiana, Mexico and Arizona. May–Sept.



4. Gaillardia suàvis (A. Gray) Britt. & Rusby. Rayless Gaillardia. (Fig. 3978.)

Agassizia suavis A. Gray, Proc. Am. Acad. 1: 49. 1846.
Gaillardia simplex Scheele, Linnaea, 22: 160. 1849.
Gaillardia suavis Britt. & Rusby, Trans. N. Y. Acad. Sci. 7: 11. 1887.

Annual or biennial. Leaves in a basal tuft, or a few near the base of the slender pubescent scape, spatulate or obovate in outline, 2′–6′ long, pinnatifid, dentate, or some of them entire; scape 1°–2° high, monocephalous; head about 1′ broad with the odor of heliotrope, globose in fruit; rays none, or short and pistillate, or a few of them longer and neutral; bracts of the involucre oblong or lanceolate, sparingly pubescent; fimbrillae of the receptacle obsolete; style-appendages short, naked; achenes densely villous; pappus-scales broad, their awns very slender.

In dry rocky soil, Kansas to Texas. April–June.

80. DYSÒDIA Cav. Ann. Cient. Nat. 6: 334. 1801–2.

Erect or diffuse, branching, mostly annual, strong-scented more or less glandular herbs, with opposite or alternate, mostly finely dissected leaves, and small peduncled heads of both tubular and radiate yellow flowers. Involucre cylindric, campanulate or nearly hemispheric, its bracts in 1 series, united into a cup, usually with a few small additional outer ones. Receptacle flat, pubescent, or covered with short bristles. Ray-flowers pistillate, the rays short. Disk-flowers perfect, their corollas 5-toothed. Anthers entire or minutely 2-toothed at the base. Style-branches of the disk-flowers elongated, hirsute, sometimes apiculate. Achenes narrowly obpyramidal, 3–5-angled, striate. Pappus of about 10 scales, parted to beyond the middle into numerous capillary, rather stiff, bristle-like segments. [Greek, ill-smell.]

About 15 species, natives of the south-central United States and of Mexico. Besides the following, 2 others occur in the southwestern United States.

1. Dysodia pappòsa (Vent.) A. S. Hitchcock. Fetid Marigold. False Dog-fennel. (Fig. 3979.)

Tagetes papposa Vent. Hort. Cels, *pl. 36.* 1800.
Boebera chrysanthemoides Willd. Sp. Pl. 3: 2125. 1804.
Dysodia chrysanthemoides Lag. Gen. et Sp. Nov. 29. 1816.
D. papposa Hitchc. Trans. St. Louis Acad. 5: 503. 1891.

Annual, very leafy, glabrous or finely pubescent, gland-dotted, much branched, 6′–18′ high, the branches diffuse or erect. Leaves opposite, sessile, or short-petioled, ½′–1½′ long, pinnately parted into linear or slightly spatulate, sharply serrate or incised segments; heads numerous, short-peduncled, 3″–5″ broad; involucre campanulate, of 8–10 appressed oblong obtuse, green or purplish, glabrous or ciliate bracts, with several narrow shorter outer ones; rays few, not longer than the width of the disk; receptacle and achenes pubescent.

Along streams and roadsides, Ohio to Minnesota and Nebraska, south to Louisiana, Mexico and Arizona. Occasionally found as a weed in waste places in the Eastern and Middle States, and in Ontario. July–Oct.

81. THYMOPHÝLLA Lag. Gen. et Sp. Nov. 25. 1816.

[HYMENATHERUM Cass. Bull. Soc. Philom. 1817: 12. 1817.]

Annual or perennial herbs, some species low undershrubs, with gland-dotted foliage and involucre, alternate or opposite leaves, and small heads of both tubular and radiate, mostly yellow flowers. Involucre campanulate, its principal bracts united into a cup, sometimes with smaller outer ones. Receptacle naked, or fimbrillate, not chaffy. Ray-flowers pistillate, fertile. Disk-flowers perfect, fertile. Style-branches truncate or blunt. Achenes striate. Pappus of several or numerous scales or bristles. [Greek, thyme-leaf, not applicable to the following species.]

About 15 species, natives of America. Besides the following, some 4 others occur in the western parts of the United States.

1. Thymophylla àurea (A. Gray) Greene. Thyme-leaf. (Fig. 3980.)

Lowellia aurea A. Gray, Mem. Am. Acad. (II) 4: 91. 1849.
Hymenatherum aureum A. Gray, Proc. Am. Acad. 19: 42. 1883.

Annual, glabrous, 4′–12′ high, much branched; the leaves and involucre with large oval oil-glands. Leaves alternate, or the lower opposite, sessile, or nearly so, very deeply parted into 5–9 linear-filiform, mostly entire, blunt segments; heads numerous, corymbose, 6″–10″ broad, terminating the branches; involucre about 3″ high, its bracts acute; rays about 12, 2½″–3″ long; pappus of 6–8 erose truncate scales, somewhat longer than the thickness of the achene.

Kansas and Colorado to Texas. June–Sept.

82. PÉCTIS L. Syst. Nat. Ed. 10, 2: App. 1376. 1759.

Annual or perennial, diffuse prostrate or erect, mostly glabrous herbs, gland-dotted and strong-scented, with opposite narrow sometimes ciliate leaves, and small usually cymose heads of both tubular and radiate yellow flowers. Involucre cylindric, oblong or campanulate, its bracts in 1 series, narrow, keeled, distinct. Receptacle small, naked. Ray-flowers pistillate, the rays small, entire or 3-lobed. Disk-flowers perfect, their corollas with expanded, somewhat irregularly 5-cleft limbs. Anthers entire at the base. Style-branches of the disk-flowers very short, obtuse. Achenes linear, slightly angled, striate. Pappus of several or numerous scales, slender bristles or awns, sometimes with a few outer smaller additional ones. [Latin, *pecten*, comb, referring to the pappus.]

About 50 species, natives of the warmer parts of America. Besides the following, about 10 others occur in the southern and western parts of the United States.

1. Pectis angustifòlia Torr. Lemon-scented Pectis. (Fig. 3981.)

Pectis angustifolia Torr. Ann. Lyc. N. Y. 2: 214. 1827.

Annual, much branched, 4′–12′ high, the branches diffuse or ascending. Leaves narrowly linear, sessile, obtusish, ½′–2′ long, 1″ wide or less, often ciliate with a few bristles near the base; heads several or numerous, short-peduncled, about 3″ broad; involucre short-cylindric or narrowly campanulate, its bracts about 8, linear, acutish, partly enclosing the outer achenes; rays few, 3-toothed, or entire; pappus a crown of 4–6 somewhat united short scales, with or without 2 slender short awns.

In dry soil, Nebraska and Colorado to Mexico and Arizona. Plant with the odor of lemons. May–Oct.

83. ACHILLÈA L. Sp. Pl. 898. 1753.

Herbs, mostly perennial, with erect leafy stems, finely dissected, pinnatifid or serrate alternate leaves, and small heads of both tubular and radiate flowers, corymbose at the ends of the stem and branches. Involucre obovoid, or campanulate, its bracts appressed, imbricated in few series, the outer shorter. Receptacle nearly flat or convex, chaffy, the membranous chaff subtending the disk-flowers. Ray-flowers pistillate, fertile, the rays white or pink. Disk-flowers perfect, fertile, their corollas yellow, 5-lobed. Anthers obtuse and entire at the base. Style-branches of the disk-flowers truncate. Achenes oblong or obovate, slightly compressed. Pappus none. [Named for Achilles.]

About 75 species, natives of the northern hemisphere, mostly of the Old World. Besides the following, another, or perhaps 2 others, occur in northwestern North America.

Involucre broadly campanulate; leaves serrate. 1. *A. Ptarmica.*
Involucre ovoid; leaves finely dissected. 2. *A. Millefolium.*

1. Achillea Ptàrmica L. Sneezewort. White Tansy. Sneezewort-Yarrow. (Fig. 3982.)

Achillea Ptarmica L. Sp. Pl. 898. 1753.

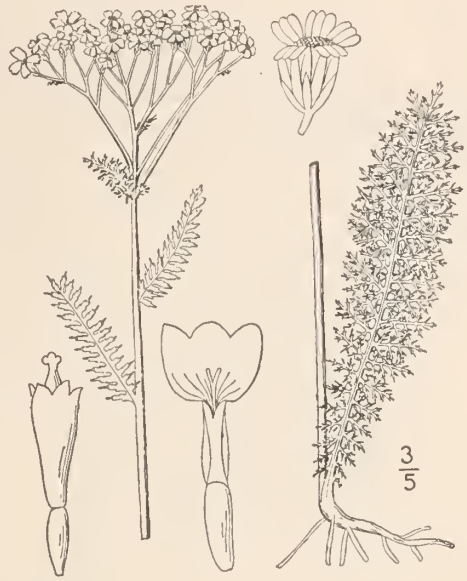
Perennial from horizontal or creeping rootstocks; stem glabrous, or slightly pubescent, nearly or quite simple, 1°–2° high. Leaves linear or linear-lanceolate, sessile and slightly clasping at the base, acute at the apex, regularly and closely serrate, sometimes pubescent on the veins beneath, 1′–2½′ long, 1½″–3″ wide; heads not very numerous, 5″–9″ broad; peduncles puberulent; involucre broadly campanulate, its bracts ovate-oblong, obtuse or obtusish, slightly tomentose; rays 5–15, white, rather large.

In moist soil, Newfoundland, New Brunswick and Quebec to Massachusetts and Michigan. Naturalized from Europe. Native also of northern Asia. Called also Goose-tongue, Wild, Bastard or European Pellitory, Fair Maid of France, Sneezewort Tansy. July–Sept.

2. Achillea Millefòlium L. Yarrow. Milfoil. (Fig. 3983.)

Achillea Millefolium L. Sp. Pl. 899. 1753.

Perennial from horizontal rootstocks; flowering stems pubescent, or nearly glabrous, simple, or corymbosely branched above, 1°–2° high. Basal leaves, and those of the numerous short sterile shoots, mostly petioled, sometimes 10′ long and ½′ wide, those of the stem sessile, all narrowly oblong or lanceolate in outline and finely dissected into narrow pinnatifid segments, tomentose, pubescent or nearly glabrous; heads numerous, 2″–3″ broad, in terminal compound dense, somewhat convex corymbs; involucre ovoid, its bracts oblong, obtusish, pubescent; rays 4-6, white, or often pink or purple.



In various situations throughout North America; in the east occurring as a naturalized weed, greener and less tomentose than the native western plant, which is probably specifically distinct. Native also of Europe and Asia. Old names, Sanguinary, Thousand-leaf, Nosebleed, Old Man's Pepper, Soldier's Woundwort. June–Nov.

84. ÁNTHEMIS L. Sp. Pl. 893. 1753.

Annual or perennial herbs, with pinnatifid or dissected, alternate leaves, and usually large peduncled heads of both tubular and radiate flowers, terminating the branches. Involucre hemispheric, its bracts imbricated in several series, scarious-margined, appressed, the outer shorter. Receptacle convex, conic or oblong, chaffy at least toward the summit, the chaff subtending the disk-flowers. Ray-flowers pistillate and fertile, or neutral, the tube terete or 2-winged, the ray white or yellow, entire or 2–3-toothed. Disk-flowers perfect, fertile, yellow, their corollas with 5-cleft limbs. Anthers obtuse and entire at the base. Style-branches of the disk-flowers truncate. Achenes oblong, angled, ribbed or striate. Pappus none, or a short coroniform border. [Greek name of Camomile.]

About 60 species, natives of Europe, Asia and Africa.

Rays white.
- Rays neutral; plant glabrous, or nearly so, fetid. — 1. *A. Cotula.*
- Rays pistillate; plants pubescent.
  - Annual; chaff of the receptacle acute. — 2. *A. arvensis.*
  - Perennial; chaff of the receptacle obtuse. — 3. *A. nobilis.*

Rays yellow; plant pubescent, or tomentose. — 4. *A. tinctoria.*

1. Anthemis Cótula L. Mayweed. Dog's, or Fetid Camomile. Dillweed. (Fig. 3984.)

Anthemis Cotula L. Sp. Pl. 894. 1753.
Maruta Cotula DC. Prodr. 6: 13. 1837.

Annual, glabrous, or sometimes pubescent above, glandular and with a fetid odor and acrid taste, much branched, 1°–2° high. Leaves mostly sessile, 1′–2′ long, finely 1–3-pinnately dissected into narrow, or almost filiform, acute lobes; heads commonly numerous, about 1′ broad; bracts of the involucre oblong, obtuse or obtusish, usually somewhat tomentose; rays 10–18, white, at length reflexed, neutral, or rarely with abortive pistils, mostly 3-toothed; receptacle convex, becoming oblong, its chaff bristly, subtending the central flowers; achenes 10-ribbed, rugose or glandular-tuberculate; pappus none.

In fields, waste places and along roadsides, all over North America except the extreme north. Naturalized from Europe, and widely distributed as a weed in Asia, Africa and Australasia. Other names are Mather, Dog-fennel, Dog-finkle, Morgan. June–Nov.

2. Anthemis arvénsis L. Corn or Field Camomile. (Fig. 3985.)

Anthemis arvensis L. Sp. Pl. 894. 1753.

Annual or sometimes biennial, not fetid; stem finely pubescent, usually much branched, about 1° high, the branches decumbent or ascending. Leaves sessile, 1′–3′ long, 1–2-pinately parted into linear or lanceolate acute lobes, less divided than those of the preceding species and with broader segments; heads commonly numerous, 1′–1½′ broad; bracts of the involucre oblong, obtuse, usually somewhat pubescent, with broad scarious margins; rays 10–18, white, pistillate, spreading, mostly 2-toothed; chaff of the obtuse receptacle lanceolate, acute or acuminate; achenes oblong, obtusely 4-angled; pappus a mere border.

In fields and waste places, Nova Scotia to Virginia, west to Michigan, Missouri, and on the Pacific coast. Naturalized from Europe. May–Aug.

3. Anthemis nóbilis L. Garden, Scotch, White or Low Camomile. (Fig. 3986.)

Anthemis nobilis L. Sp. Pl. 894. 1753.

Perennial, pubescent, aromatic, much branched, 6′–18′ high, the branches procumbent. Leaves numerous, 1′–2′ long, finely and compactly dissected into nearly filiform lobes and segments; heads about 1′ broad; bracts of the involucre obtuse, pubescent, their scarious margins broad; rays 12–18, white, spreading, pistillate, 2–3-toothed; chaff of the conic receptacle broad, membranous, obtuse; achenes oblong, obtusely 3-angled; pappus none.

Sparingly escaped from gardens, Rhode Island to Delaware and Michigan. Adventive from Europe. June–Aug.

4. Anthemis tinctòria L. Yellow or Ox-eye Camomile. (Fig. 3987.)

Anthemis tinctoria L. Sp. Pl. 896. 1753.

Perennial, pubescent or tomentose; stem erect, branched, 1°–3° high, with nearly erect branches. Leaves sessile, 1′–3′ long, pinnately divided, the oblong segments pinnatifid into narrow acute lobes; heads few or several, 1′–1½′ broad; bracts of the involucre oblong, obtuse, densely tomentose; rays 20–30, pistillate, usually 2-toothed, bright yellow or sometimes paler; chaff of the nearly hemispheric receptacle lanceolate, acuminate, rather rigid; achenes 4-angled, somewhat compressed; pappus a crown-like border.

In fields and waste places, Maine to New Jersey, and locally escaped from gardens. Adventive from Europe. Native also of Asia. June–Sept.

85. CHRYSÁNTHEMUM L. Sp. Pl. 888. 1753.

Perennial or annual, mostly erect and branching herbs, with alternate dentate incised or dissected leaves, and large, usually long-peduncled heads of both tubular and radiate flowers, or rays rarely wanting. Involucre hemispheric or depressed, its bracts appressed, imbricated in several series, the outer shorter. Receptacle flat, convex or hemispheric, naked. Ray-flowers pistillate, fertile, the rays white, yellow or rose-colored, entire or toothed. Disk-flowers perfect, fertile, their corollas with terete or 2-winged tubes and 4–5-cleft limbs. Anthers obtuse and entire at the base. Style-branches of the disk-flowers truncate, penicillate. Achenes angled or terete, 5–10-ribbed, those of the ray-flowers commonly 3-angled. Pappus none, or a scaly cup. [Greek, golden-flower.]

About 100 species, of wide geographic distribution in the northern hemisphere. Besides the following, 2 others occur in northwestern arctic America. Our species have white ray-flowers.

Heads large, few or solitary at the ends of the stem or branches.
- Stem-leaves linear-spatulate, pinnately incised; weed. 1. *C. Leucanthemum.*
- Stem-leaves cuneate-spatulate, toothed or lobed above; arctic. 2. *C. arcticum.*

Heads numerous, small, corymbose; plants escaped from gardens.
- Leaves pinnatifid, the segments incised. 3. *C. Parthenium.*
- Leaves oblong, serrate. 4. *C. Balsamita.*

1. Chrysanthemum Leucánthemum L. White-weed. White or Ox-eye Daisy. (Fig. 3988.)

C. Leucanthemum L. Sp. Pl. 888. 1753.
Leucanthemum vulgare Lam. Fl. Fr. 2: 137. 1778.

Perennial; stem glabrous, or sparingly puberulent, simple or little branched, 1°–3° high, often tufted, the branches nearly erect. Basal leaves obovate, oblong, or spatulate, coarsely dentate or incised, narrowed into long slender petioles; stem-leaves mostly sessile and partly clasping, 1′–3′ long, linear-spatulate or linear, pinnately incised or toothed, the uppermost very small and nearly entire; heads few or solitary, 1′–2′ broad, on long naked peduncles; rays 20–30, white, spreading, slightly 2–3-toothed; bracts of the involucre oblong-lanceolate, obtuse, mostly glabrous, with scarious margins and a brown line within the margins; pappus none.

In pastures, meadows and waste places, common throughout our area as a weed, but less abundant in the south and west. Naturalized from Europe. Native also of Asia. Other English names are Dog-, Bull-, Butter-, Big-, Midsummer-, Moon-, Horse-, Poorland- or Maudlin-Daisy, Dutch Morgan, Moon-flower, Moon-penny, Great White Ox-eye, Poverty-weed, White Man's Weed, Herb-Margaret. Rays rarely short and tubular. Disk bright yellow. May–Nov.

2. Chrysanthemum àrcticum L. Arctic Daisy. (Fig. 3989.)

Chrysanthemum arcticum L. Sp. Pl. 889. 1753.
Leucanthemum arcticum DC. Prodr. 6: 45. 1837.

Similar to the preceding species, but somewhat fleshy, lower, seldom over 1½° high. Leaves cuneate-spatulate, 18″–3′ long, crenate or cleft at the apex, narrowed into a long tapering entire base, or the lower into slender petioles, slightly clasping at the base, the uppermost few, small, linear and nearly entire; heads solitary or few, long-peduncled, 1′–2′ broad; rays 20–30, white; bracts of the involucre oblong, obtuse, brown, or with broad brown scarious margins, usually pubescent; pappus none.

Coast of Hudson Bay to Alaska. Also in arctic Europe and Asia. Summer.

3. Chrysanthemum Parthènium (L.) Pers. Common Feverfew. Featherfew. (Fig. 3990.)

Matricaria Parthenium L. Sp. Pl. 890. 1753.
Chrysanthemum Parthenium Pers. Syn. 2: 462. 1807.

Perennial; stem puberulent or glabrate, much branched, 1°–2½° high. Leaves thin, the lower often 6′ long, petioled, or the upper sessile, pinnately parted into ovate or oblong, pinnatifid or incised segments; heads numerous, corymbose, slender-peduncled, 6″–10″ broad; bracts of the depressed involucre lanceolate, rather rigid, keeled, pubescent, acute or acutish; rays 10–20, white, oval or obovate, spreading, mostly toothed, long-persistent; pappus a short toothed crown.

In waste places, New Brunswick and Ontario to New Jersey, and locally in the interior, mostly escaped from gardens. Naturalized or adventive from Europe. Called also Pellitory, Wild Camomile. Rays variable in length. Summer.

4. Chrysanthemum Balsámita L. Costmary. (Fig. 3991.)

Chrysanthemum Balsamita L. Sp. Pl. Ed. 2, 1252. 1763.

Pyrethrum Balsamita Willd. Sp. Pl. 3: 2153. 1804.

Perennial, puberulent or canescent; stem much branched, 2°–4° high. Leaves oblong, obtuse, crenate-dentate, 1′–2′ long, those of the stem mostly sessile, and often with a pair of lateral lobes at the base; heads numerous, corymbose, slender-peduncled, 5″–8″ broad, or when rayless only 3″ broad; bracts of the involucre narrow, obtuse, pubescent; rays 10–15, white, spreading; pappus a short crown.

Sparingly escaped from gardens, Ohio to Ontario and Nova Scotia. Native of the Old World. Other English names are Cost, Alecost, Alecoast. Summer.

86. MATRICÀRIA L. Sp. Pl. 890. 1753.

Annual or perennial, mostly erect herbs, similar to some species of the preceding genus, with alternate leaves, dissected into filiform or narrowly linear segments and lobes, and peduncled heads of both tubular and radiate flowers, or rays wanting in some species. Involucre hemispheric, its bracts appressed, imbricated in few series, the outer shorter. Receptacle conic, elongated or hemispheric, naked. Rays, when present, white, pistillate and fertile. Disk-flowers yellow, perfect, fertile, their corollas 4–5-toothed. Anthers obtuse and entire at the base. Style-branches of the disk-flowers truncate, penicillate. Achenes 3–5-ribbed. Pappus none, or a coroniform border. [Latin, matrix, from its medicinal virtues.]

About 20 species, natives of the northern hemisphere and South Africa. The following are the only ones known to occur in North America.

Rays present, white.
- Achenes obpyramidal, strongly 3-ribbed.
  - Plant tall, much branched; bracts of the involucre green. — 1. *M. inodora.*
  - Plant low, nearly simple, arctic; bracts dark brown or black. — 2. *M. grandiflora.*
- Achenes nearly terete, oblong, faintly 3–5-ribbed. — 3. *M. Chamomilla.*

Rays none; achenes oblong, faintly nerved. — 4. *M. matricarioides.*

1. **Matricaria inodòra** L. Scentless Camomile. Corn Mayweed. (Fig. 3992.)

Matricaria inodora L. Fl. Suec. Ed. 2, 297. 1755.
Chrysanthemum inodorum L. Sp. Pl. Ed. 2, 1253. 1763.

Annual; stem usually much branched, glabrous, or very nearly so throughout, 1°–2° high. Leaves numerous, sessile, 2–3-pinnately dissected into filiform lobes, the rachis somewhat dilated at the base. Heads several or numerous, terminating the branches, ½′–1½′ broad; bracts of the involucre lanceolate-oblong, obtuse, green with brown scarious margins; rays 20–30, white, spreading; receptacle hemispheric or ovoid; achenes obpyramidal with three prominent ribs; pappus a short entire or 4-toothed crown.

In fields and waste places, Newfoundland to New Jersey, and locally in the interior. Naturalized or adventive from Europe. June–Sept.

2. **Matricaria grandiflòra** (Hook.) Britton. Arctic Camomile. (Fig. 3993.)

Chrysanthemum grandiflorum Hook. in Parry's 2d Voy. 398. 1825.
Pyrethrum inodorum var. *nanum* Hook. Fl. Bor. Am. 1: 320. 1833.
M. grandiflora Britton, Mem. Torr. Club, 5: 340. 1894.

Perennial; stem usually simple and monocephalous, glabrous, 4′–12′ high. Leaves sessile, or the lowest short-petioled, 1–2-pinnately dissected, 1′–2½′ long. Head not very long-peduncled, 1′–2′ broad; bracts of the involucre ovate or ovate-oblong, obtuse, glabrous, brown or nearly black, or with broad, brown, scarious margins; rays 15–35, bright white, slightly 3–5-toothed at the summit; receptacle hemispheric when mature.

Coast of Hudson Bay to Alaska. Reported from Lake Huron. Summer.

3. **Matricaria Chamomílla** L. Wild or German Camomile. (Fig. 3994.)

Matricaria Chamomilla L. Sp. Pl. 891. 1753.

Annual, glabrous, much branched, 1°–2° high. Leaves aromatic, finely 2-3-pinnately dissected into numerous linear lobes; heads numerous, 8″–12″ broad, slender-peduncled at the ends of the branches; bracts of the involucre oblong, obtuse, green, or with brownish margins; rays 10–20, white, spreading; receptacle ovoid, becoming conic and hollow; achenes nearly oblong, or somewhat obovoid, faintly 3–5-ribbed; pappus none.

In waste places and on ballast, southern New York to Pennsylvania. Adventive or fugitive from Europe. Called also Horse-gowan. Summer.

4. Matricaria matricarioides (Less.) Porter. Rayless Camomile. (Fig. 3995.)

Santolina suaveolens Pursh, Fl. Am. Sept. 520. 1814. Not *M. suaveolens* L. 1755.
Artemisia matricarioides Less. Linnaea, 6: 210. 1831.
Matricaria discoidea DC. Prodr. 6: 50. 1837.
Matricaria matricarioides Porter, Mem. Torr. Club, 5: 341. 1894.

Annual, glabrous; stem very leafy, at length much branched, 6′–18′ high. Leaves 2–3-pinnately dissected into linear acute lobes; heads numerous, 3″–4″ broad, peduncled; bracts of the involucre oval or oblong, green with broad white scarious margins, much shorter than the ovoid yellow disk; rays none; receptacle conic; achenes oblong, slightly angular, faintly nerved, pappus an obscure crown, sometimes produced into 2 coriaceous oblique auricles.

In waste places, in ballast and along railroads, Missouri to Maine. Adventive from the Pacific coast. Naturalized as a weed in northern Europe. May–Aug.

87. TANACETUM L. Sp. Pl. 843. 1753.

Erect, strongly aromatic herbs, our species perennials, with alternate, 1–3-pinnately dissected or divided leaves, and numerous small corymbose heads of tubular flowers, or with rays sometimes present and imperfectly developed. Involucre hemispheric, depressed, or campanulate, its bracts appressed, imbricated in several series. Receptacle flat or convex, naked. Marginal flowers pistillate, fertile, their corollas 2–5-toothed or lobed, sometimes produced into short rays. Disk-flowers perfect, fertile, their corollas 5-toothed. Anthers obtuse and entire at the base, their tips broad. Style-branches truncate and penicillate at the summit. Achenes 5-angled or 5-ribbed, truncate or obtuse. Pappus none, or a short crown. [From tanasie, old French for tansy; Greek, athanasia, immortality.]

About 35 species, natives of the northern hemisphere. Besides the following, 6 others occur in western and northwestern North America.

Glabrous, or nearly so; heads numerous, 3″–5″ broad. 1. *T. vulgare.*
Villous-pubescent; heads few, 6″–8″ broad. 2. *T. Huronense.*

1. Tanacetum vulgàre L. Tansy. (Fig. 3996.)

Tanacetum vulgare L. Sp. Pl. 844. 1753.

Stem stout, usually simple up to the inflorescence, glabrous, or sparingly pubescent, 1½°–3° high. Leaves pinnately divided into linear-oblong, pinnatifid or incised segments, the lobes acute, usually serrate; lower segments of the leaves often smaller than the others; basal leaves often 1° long; heads commonly numerous, 3″–5″ broad, rather short-peduncled; involucre depressed-hemispheric, its bracts oblong-lanceolate, obtuse, or the outer acute, slightly pubescent or ciliate; receptacle flat; flowers yellow; marginal corollas with short oblique 3-toothed limbs; pappus a short crown.

Along roadsides, mostly escaped from gardens, Nova Scotia and Ontario to Minnesota, south to North Carolina and Missouri. Naturalized or adventive from Europe. Other English names are Bitter Buttons, Hindheal, Ginger-plant. July-Sept.

Tanacetum vulgàre crispum DC. Prodr. 6: 128. 1837.
Leaf-segments more incised and crisped. Occasional, in similar situations. In some places more plentiful than the type.

2. Tanacetum Huronénse Nutt.
Lake Huron Tansy. (Fig. 3997.)

Tanacetum Huronense Nutt. Gen. 2: 141. 1818.

Villous-pubescent throughout, at least when young, less so when mature, 1°–2° high. Leaves 2-pinnately divided, the lobes dentate or incised, acute, the lower segments commonly smaller than the others; heads 1–8, 6″–8″ broad, on very stout pubescent peduncles; involucre depressed-hemispheric; marginal flowers with 3–5-lobed limbs, often expanded into short rays; pappus a short crown.

In moist soil, especially along streams or lakes, New Brunswick to Hudson Bay, Maine, Lake Superior, Alaska and Oregon. July–Sept.

88. ARTEMÍSIA L. Sp. Pl. 845. 1753.

Odorous herbs or shrubs, often canescent or tomentose, with alternate leaves, and small pendulous or erect, discoid racemose spicate glomerate or paniculate heads, of greenish or yellowish flowers. Involucre ovoid, oblong, or broadly hemispheric, its bracts imbricated in few series, the outer gradually shorter. Receptacle flat, convex or hemispheric, naked or pubescent, not chaffy. Central flowers perfect, sometimes sterile, with abortive ovaries and undivided styles, sometimes perfect and fertile, with truncate style-branches; marginal flowers usually pistillate and fertile, their corollas 2–3-toothed; or flowers all perfect and fertile in some species. Anthers obtuse and entire at the base, often tipped with subulate appendages. Achenes obovoid or oblong, 2-ribbed or striate, rounded at the summit, usually bearing a large epigynous disk. Pappus none. [Named for Artemisia, wife of Mausolus.]

About 200 species, natives of the northern hemisphere and southern South America. Besides the following, some 25 others occur in the western parts of North America.

* Marginal flowers pistillate; central flowers perfect, sterile.

a. Biennial or perennial herbs.

Leaves pinnately dissected into narrowly linear lobes.
- Heads very numerous, 1″ broad; leaves mostly glabrous. — 1. *A. caudata.*
- Heads 2″ broad, in narrow panicles; leaves silky-pubescent.
  - Heads few; involucre brown, mostly pubescent. — 2. *A. borealis.*
  - Heads numerous; involucre green, mostly glabrous. — 3. *A. Canadensis.*

Leaves linear, the lower sometimes 3-cleft or pinnately divided.
- Leaves glabrous. — 4. *A. dracunculoides.*
- Leaves finely and densely pubescent. — 5. *A. glauca.*

b. Shrubby, silvery-canescent; heads small and numerous. — 6. *A. filifolia.*

* * Marginal flowers pistillate; central flowers perfect, fertile.

a. Receptacle villous-pubescent.

Leaf-segments linear-filiform, short. — 7. *A. frigida.*
Leaf-segments oblong, or linear-oblong; introduced. — 8. *A. Absinthium.*

b. Receptacle glabrous, or sparingly pubescent.

Leaves dissected, glabrous or pubescent, green, not tomentose.
- Heads about 2″ broad, numerous in panicled racemes; perennial. — 9. *A. Abrotanum.*
- Heads about 1″ broad, paniculate or spicate; annuals.
  - Leaves finely 2–3-pinnately divided; heads paniculate. — 10. *A. annua.*
  - Leaves pinnately divided; segments pinnatifid; heads in leafy spikes. — 11. *A. biennis.*

Leaves densely white-canescent or tomentose, at least beneath.
- Leaves pinnatifid or dissected.
  - Heads 3″–4″ broad, racemose-glomerate; sea-beach plant. — 12. *A. Stelleriana.*
  - Heads 1″–2″ broad, spicate-paniculate or racemose.
    - Leaves deeply pinnatifid, the segments mostly incised. — 13. *A. vulgaris.*
    - Leaves finely dissected into short linear lobes. — 14. *A. Pontica.*
    - Leaves pinnately parted into 5–7 narrow entire segments. — 15. *A. Kansana.*
- Leaves lanceolate or linear, serrate or entire, not pinnatifid.
  - Leaves lanceolate, sharply serrate, glabrous above. — 16. *A. serrata.*
  - Leaves linear, oblong, or lanceolate, entire or lobed.
    - Leaves elongated, at length glabrous above. — 17. *A. longifolia.*
    - Leaves shorter, oblong or lanceolate, tomentose both sides. — 18. *A. gnaphalodes.*
- Leaves cuneate, ½′ long, 3-toothed at the apex. — 19. *A. Bigelovii.*

* * * Flowers all perfect and fertile; far western species.

Leaves cuneate, 3-toothed or 3-lobed. — 20. *A. tridentata.*
Leaves linear, entire. — 21. *A. cana.*

1. Artemisia caudàta Michx. Tall or Wild Wormwood. (Fig. 3998.)

Artemisia caudata Michx. Fl. Bor. Am. 2: 129. 1803.

Root biennial (sometimes perennial?); stems slender, glabrous, tufted, strict, very leafy, 2°–6° high, at length paniculately branched, the branches glabrous, or rarely slightly pubescent, nearly erect. Lower and basal leaves and those of sterile shoots slender-petioled, sometimes a little pubescent, 3′–6′ long, 2–3-pinnately divided into narrowly linear acute lobes about ½″ wide; upper leaves sessile or nearly so, pinnately divided, or the uppermost entire and short; heads about 1″ broad, very short-peduncled, very numerous in a large somewhat leafy panicle, mostly nodding; bracts of the ovoid-campanulate involucre ovate, or the inner elliptic, glabrous; receptacle hemispheric, naked; central flowers sterile.

In dry sandy soil, abundant on sea-beaches, from Quebec to Florida, west to Manitoba, Nebraska and Texas. July–Sept.

2. Artemisia boreàlis Pall. Northern Wormwood. (Fig. 3999.)

Artemisia borealis Pall. Iter. 129. *pl. hh, f. 1.* 1771.
Artemisia Groenlandica Wormsk. Fl. Dan. *pl. 1585.* 1818.

Perennial, 5′–15′ high, densely silky-pubescent all over, resembling small forms of the following species. Leaves less divided, the basal and lower ones petioled, 1′–2½′ long, the upper sessile, linear and entire or merely 3-parted; heads about 2″ broad in a dense terminal rarely branched thyrsus; involucre nearly hemispheric, its bracts brown or brownish, pilose-pubescent or nearly glabrous; receptacle convex, naked; disk-flowers sterile.

Maine (according to Fernald); Quebec to Greenland, west through arctic America to Alaska, south in the Rocky Mountains to Colorado. Also in northern Asia. July–Aug.

3. Artemisia Canadénsis Michx. Canada Wormwood. (Fig. 4000.)

Artemisia Canadensis Michx. Fl. Bor. Am. 2: 129. 1803.

Root perennial (or sometimes biennial); stem pubescent or glabrous, strict, simple or branched, 1°–2° high, the branches appressed and erect. Leaves usually pubescent, but sometimes sparingly so, the basal and lower ones petioled, 2′–3′ long, 2-pinnately divided into linear acute lobes which are shorter and broader than those of *Artemisia caudata;* upper leaves sessile, less divided; heads short-peduncled, about 2″ broad, commonly numerous in a narrow virgate panicle, mostly spreading or erect, in small forms the panicle reduced to a nearly or quite simple terminal raceme; involucre ovoid, its bracts ovate or oval, green, glabrous or pubescent; receptacle hemispheric; central flowers sterile.

In rocky soil, Hudson Bay to northern Maine and Vermont, west along the Great Lakes to Minnesota and Manitoba and to the Canadian Pacific coast, south in the Rocky Mountains to Arizona, and to Nebraska. Called also Sea or Wild Wormwood. July–Aug.

4. Artemisia dracunculoides Pursh. Linear-leaved Wormwood. (Fig. 4001.)

Artemisia dracunculoides Pursh, Fl. Am. Sept. 742. 1814.

Perennial, glabrous; stem somewhat woody, usually much branched, 2°–4° high, the branches nearly erect. Leaves linear, 1′–3½′ long, 1″–2″ wide, acute, entire, or the lower and basal ones sometimes 3-cleft or even more divided; heads very numerous, 1″–1½″ broad, nodding, very short-peduncled, racemose-paniculate; involucre nearly hemispheric, its bracts ovate or oblong, green, scarious-margined; receptacle hemispheric, naked; disk-flowers sterile.

Dry plains and prairies, Manitoba to the Northwest Territory and British Columbia, south to Nebraska, Texas, New Mexico and California. July–Nov.

5. Artemisia glaùca Pall. Silky Wormwood. (Fig. 4002.)

A. glauca Pall.; Willd. Sp. Pl. 3: 1831. 1804.
Artemisia dracunculoides var. *incana* T. & G. Fl. N. A. 2: 416. 1843.

Perennial, similar to the preceding species; stems strict, leafy, usually simple or little branched, 1°–2° high, pubescent, tomentose or canescent, or glabrous below. Leaves linear, ½′–2½′ long, about 1″ wide, entire, finely and densely pubescent, obtuse or obtusish, or the lower or sometimes nearly all of them 3-cleft into linear lobes 1′–1½′ long; panicle narrow, branched, its branches nearly erect; heads drooping, sessile, very numerous, scarcely more than 1½″ long; involucre hemispheric, its bracts scarious-margined, obtuse; receptacle naked; disk-flowers sterile.

Minnesota and Manitoba to the Northwest Territory.

6. Artemisia filifòlia Torr. Silvery Wormwood. (Fig. 4003.)

Artemisia filifolia Torr. Ann. Lyc. N. Y. 2: 211. 1827.

Shrubby, finely silvery-canescent throughout; stem branched, 1°–3° high, the rigid branches nearly erect. Leaves 1′–2′ long, nearly all 3-parted into filiform entire segments less than ½″ wide, or the uppermost undivided; heads exceedingly numerous, about ½″ broad, racemose-paniculate, very short-peduncled, 3–5-flowered; involucre oblong, its bracts densely canescent; receptacle small, naked or slightly fimbrillate; central 1–3 flowers sterile.

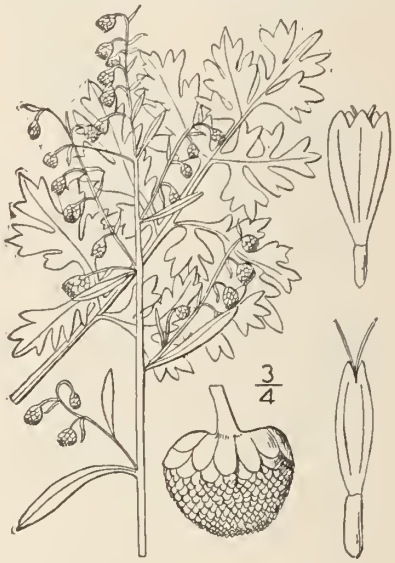
On dry plains, Nebraska to Utah, south to Texas, Mexico and New Mexico. Wormwood Sage. July–Oct.

7. Artemisia frígida Willd. Pasture Sage-Brush. Wormwood Sage. (Fig. 4004.)

Artemisia frigida Willd. Sp. Pl. 3: 1838. 1804.

Perennial, woody at the base, densely silky-canescent all over; stem branched or simple, 10′–20′ high. Leaves ½′–1½′ long, ternately or 5-nately divided into numerous short acutish mostly entire lobes less than ½″ wide, the lower and basal ones petioled, and often with a pair of entire or 3-cleft divisions near the base of the petiole, the upper sessile and less divided; heads rather numerous, racemose or racemose-paniculate, short-peduncled, nodding, about 2″ broad; involucre hemispheric, its bracts oblong, canescent or tomentose; receptacle villous-pubescent; central flowers fertile.

On dry plains and in rocky soil, Minnesota to the Northwest Territory and Idaho, south to Nebraska, Texas and New Mexico. Called also Wild Sage. July–Oct.



8. Artemisia Absínthium L. Common Wormwood. Absinth. (Fig. 4005.)

Artemisia Absinthium L. Sp. Pl. 848. 1753.

Shrubby, finely canescent; stem much branched, 2°–4° high. Leaves 2′–5′ long, 1–3-pinnately divided into numerous oblong to obovate obtuse lobes, the lower long-petioled, the upper short-petioled or sessile, the uppermost commonly linear and entire; heads numerous, yellow, racemose-paniculate, drooping, short-peduncled, 2″–2½″ broad; involucre hemispheric, its outer bracts linear, the inner much broader, scarious-margined; receptacle pilose-pubescent; central flowers fertile, the marginal ones fertile or sterile.

In waste places, Newfoundland and Hudson Bay to Massachusetts, western Ontario and New York. Naturalized or adventive from Europe, mostly escaped from gardens. Old English names, Maderwort, Mugwort, Mingwort, Warmot. July–Oct.

9. Artemisia Abrótanum L. Southernwood. (Fig. 4006.)

Artemisia Abrotanum L. Sp. Pl. 845. 1753.

Perennial, somewhat shrubby; stem puberulent or glabrous, much branched, 2°–4° high, the branches short, erect or ascending. Leaves glabrous or somewhat pubescent, 1′–3′ long, 1–3-pinnately parted into linear obtuse entire lobes about ½″ wide, or the uppermost linear and entire, the lowest petioled; heads several-flowered, yellow, very numerous, nodding, racemose-paniculate, 2″–2½″ broad; involucre nearly hemispheric, pubescent, its outer bracts lanceolate, acute, the inner ones obovate; receptacle glabrous; central flowers fertile.

In waste places, Massachusetts to western New York, southern Ontario, and Nebraska. Adventive from continental Europe. Old English names, Lad's Love, Boy's Love, Slovenwood, Old Man.

Artemisia prócera Willd., a similar species, but with glabrous involucre, is stated by Dr. Gray (Syn. Fl. 1: Part 2, 370) to have escaped from gardens at Buffalo, N. Y., but is not recorded in Mr. D. F. Day's Catalogue of Plants of that vicinity.

10. Artemisia ánnua L. Annual Wormwood. (Fig. 4007.)

Artemisia annua L. Sp. Pl. 847. 1753.

Annual, glabrous throughout, much branched, 2°–5° high. Leaves 2′–6′ long, finely 2–3-pinnately dissected into very narrow short obtuse lobes, the lower and basal ones slender-petioled, the upper sessile and less divided, but none of them entire; heads very numerous, about 1″ broad, drooping, borne on very slender peduncles of about their own length or less; involucre hemispheric, glabrous, its bracts few, ovate to oblong; receptacle glabrous; flowers commonly all fertile.

In waste places, Ontario to West Virginia, Tennessee and Kansas, a bad weed in some places. Adventive or naturalized from Asia. Summer.

11. Artemisia biénnis Willd. Biennial Wormwood. (Fig. 4008.)

Artemisia biennis Willd. Phytogr. 11. 1794.

Annual or biennial, glabrous throughout; stem very leafy, usually branched, 1°–4° high, the branches nearly erect. Leaves 1′–3′ long, 1–2-pinnately divided into linear or linear-oblong, acutish, serrate or incised lobes, the lowest petioled, the uppermost less divided or rarely quite entire; heads about 1½″ broad, not drooping, sessile and exceedingly numerous in axillary glomerules which are crowded, forming a compound spicate inflorescence, the subtending leaves much exceeding the clusters; involucre nearly hemispheric, its bracts green, scarious-margined; receptacle naked; central flowers fertile.

Native in the Northwest Territory and the northwestern United States, now widely distributed as a weed from Manitoba to Nova Scotia, south to Missouri, Kentucky and Pennsylvania. Plant not odorous. Aug.–Oct.

12. Artemisia Stelleriàna Bess. Beach Wormwood. (Fig. 4009.)

Artemisia Stelleriana Bess. Abrot. 79. *pl.* 5. 1829.

Perennial, densely white-tomentose; stem branched, 1°–2½° high, bushy, the branches ascending. Leaves obovate to spatulate, 1′–4′ long, pinnatifid into oblong obtuse entire or few-toothed lobes, the lower petioled, the upper sessile, all densely tomentose beneath, but becoming green and glabrous above when old; heads racemose-spicate or racemose-glomerate, 3″–4″ broad, not drooping; involucre oblong-campanulate, its bracts tomentose, lanceolate or oblong-lanceolate; receptacle naked; central flowers fertile.

Sandy sea-beaches, Maine and Massachusetts to New Jersey. Cultivated in gardens along the coast. Native of northeastern Asia. Occurs also on the coast of Sweden. Foliage similar to that of the Dusty Miller, *Cineraria maritima* L. July–Aug.

13. Artemisia vulgàris L. Common Mugwort. (Fig. 4010.)

Artemisia vulgaris L. Sp. Pl. 848. 1753.

Perennial; stem glabrous or nearly so, much branched, 1°–3½° high. Leaves 1′–4½′ long, deeply pinnatifid, into linear, oblong or somewhat spatulate, pinnatifid, toothed or entire lobes, densely white-tomentose beneath, dark green and glabrous above, the lower petioled and often with 1 or 2 pairs of small lateral divisions at or near the base of the petiole, the upper sessile, the uppermost sometimes linear and entire; heads numerous, erect, about 2″ broad, in panicled simple or compound spikes; involucre oblong-campanulate, its bracts oblong, obtusish, scarious-margined, tomentose or glabrous; receptacle naked; central flowers fertile.

In waste places, Nova Scotia to Ontario, Michigan, New Jersey and Pennsylvania. Naturalized from Europe. Native also of Asia. Reported as native in arctic America. Called also Motherwort, Fellon-herb, Sailor's Tobacco, Wormwood, Bulwand. July–Oct.

14. Artemisia Póntica L. Roman or Hungarian Wormwood. (Fig. 4011.)

Artemisia Pontica L. Sp. Pl. 847. 1753.

Perennial; stem branched, glabrous or canescent, 1°–3° high. Leaves 1½′–2½′ long, 2–3-pinnately dissected into short narrow lobes less than 1″ wide, canescent on both sides, or tomentose beneath, the lower petioled and the petioles somewhat clasping or auricled at the base, the upper mostly linear and entire; heads numerous, 1″–2″ broad, drooping, slender-peduncled; involucre hemispheric, canescent, its bracts oblong or obovate, obtuse, the outer short, lanceolate; receptacle glabrous; central flowers fertile.

Railway embankment near Tumble Station, Hunterdon Co., N. J.; mountain-side near Lily Lake, Luzerne Co., Pa. Both specimens in leaf only, and referred to this species with some hesitation. Fugitive or adventive from central Europe. July–Aug.

15. Artemisia Kansàna Britton. Kansas Mugwort. (Fig. 4012.)

Densely white-woolly all over; stem erect, much branched, the branches strict, bearing very numerous small heads forming a narrow dense panicle. Leaves numerous, crowded, the lower pinnately divided into 3–7 narrowly linear revolute-margined segments ½″ wide or less, greenish above; upper leaves mostly narrowly linear and entire; heads oblong-oval, sessile, or very short-peduncled, erect, or somewhat spreading, 1½″ long; involucre very woolly, its bracts ovate-lanceolate to oblong-lanceolate, acute; receptacle naked.

Plains, Lane Co., Kansas, Aug. 15, 1895 (A. S. Hitchcock).

16. Artemisia serràta Nutt. Saw-leaf Mugwort. (Fig. 4013.)

Artemisia serrata Nutt. Gen. 2: 142. 1818.

Perennial; stem stout, tomentose or becoming glabrous, much branched, 5°–10° high. Leaves lanceolate, 2′–6′ long, 3″–12″ wide, densely white-tomentose beneath, dark green and glabrous above, acuminate at the apex, narrowed to a sessile base, or the lowest petioled, sharply serrate or incised, or the upper entire; heads very numerous, greenish, erect, about 1½″ broad, sessile or short-peduncled in panicled spikes or racemes; involucre canescent, its bracts oblong, obtuse, or the outer ones lanceolate; receptacle naked; central flowers fertile.

Prairies, Illinois to Minnesota and Dakota. Introduced on the Mohawk River, near Schenectady, N. Y. Aug.–Oct.

17. Artemisia longifòlia Nutt. Long-leaved Mugwort. (Fig. 4014.)

Artemisia longifolia Nutt. Gen. 2: 142. 1818.

Perennial; stem densely white-tomentose, branched, 2°–5° high. Leaves linear or linear-lanceolate, elongated, entire, 2′–5′ long, 1″–5″ wide, acuminate, tapering to a sessile base, or the lower petioled, densely white-tomentose on both sides, or becoming green and glabrate above; heads numerous, erect, spicate-paniculate, about 2″ broad; involucre tomentose, its bracts oblong, obtuse; receptacle naked; central flowers fertile.

In dry rocky soil, western Nebraska to Minnesota, Montana and the Northwest Territory. Aug.–Sept.

18. Artemisia gnaphalòdes Nutt. Prairie, Western or Cud-weed Mugwort. (Fig. 4015.)

Artemisia gnaphalodes Nutt. Gen. 2: 143. 1818.
Artemisia Ludoviciana var. *gnaphalodes* T. & G. Fl. N. A. 2: 420. 1843.

Perennial, similar to the preceding species; stem white-tomentose, usually much branched, 1°–4° high. Leaves lanceolate or oblong, 1′–3′ long, 2″–6″ wide, entire, or the lower somewhat toothed, lobed or incised, white-tomentose on both sides, acute or acuminate, sessile or the lower narrowed into short petioles; heads numerous, erect, spicate-paniculate, above 1½″ broad; involucre oblong, tomentose; receptacle naked; central flowers fertile.

On prairies and dry banks, western Ontario and Illinois to British Columbia, south to Missouri, Texas, Arizona, Mexico and California. Aug.–Oct.

19. Artemisia Bigelòvii A. Gray. Bigelow's Sage-Bush. (Fig. 4016.)

Artemisia Bigelovii A. Gray, Pac. R. R. Rep. 4: 110. 1856.

Perennial, shrubby, silvery-canescent throughout, 8′–15′ high, much branched, the branches erect. Leaves narrowly cuneate, or oblong, obtuse, truncate, or 3–5-toothed at the apex, 5″–9″ long, about 1″ wide; heads very numerous, about 1″ broad, densely glomerate-spicate in a narrow virgate panicle, 2–5-flowered, 1 or 2 of the marginal ones pistillate, the others perfect and fertile; involucre short-oblong, canescent or tomentose, its bracts oblong, obtuse; receptacle naked.

Kansas (according to Smyth), and Colorado to Arizona. Aug.–Oct.

20. Artemisia tridentàta Nutt. Common Sage-bush. Sage-brush. Sage-wood. Mountain Sage. (Fig. 4017.)

Artemisia tridentata Nutt. Trans. Am. Phil. Soc. (II) 7: 398. 1841.

Shrubby, silvery-canescent; stem much branched, 1°–12° high. Leaves narrowly cuneate, ½′–1½′ long, 1″–3″ wide, sessile, 3–7-toothed at the truncate apex; heads very numerous, 5–8-flowered, about 1½″ broad, sessile, or very nearly so, in large dense panicles; involucre oblong, tomentose, its inner bracts oblong, the outer short, ovate, all obtuse or obtusish; receptacle naked; flowers all perfect and fertile.

On dry plains and in rocky soil, western Nebraska to Colorado, Utah and California, north to Montana and British Columbia. July–Sept.

21. Artemisia càna Pursh. Hoary Sage-Bush. (Fig. 4018.)

Artemisia cana Pursh, Fl. Am. Sept. 521. 1814.

Shrubby, densely white-canescent; stem much branched, 1°–2½° high. Leaves linear, linear-oblong or narrowly lanceolate, sessile, acute at both ends, 1′–2′ long, 1½″–3″ wide, usually quite entire, rarely with 2 or 3 acute teeth or lobes; heads numerous, about 1½″ broad, glomerate or sometimes solitary in the axils of the leaves, or crowded into a naked thyrsus at the summit, 5–9-flowered; involucre oblong, canescent, its inner bracts oblong or lanceolate, obtuse, usually with 1–3 shorter outer ones; receptacle naked; flowers all perfect and fertile.

Plains, Nebraska and Colorado to North Dakota and the Northwest Territory. July–Sept.

89. TUSSILÀGO L. Sp. Pl. 865. 1753.

An acaulescent herb, more or less white-tomentose, with slender perennial rootstocks, broad basal cordate, dentate or lobed, long-petioled leaves, and large solitary, monoecious heads of both tubular and radiate yellow flowers at the summit of a scaly scape, appearing before the leaves of the season. Involucre campanulate to cylindric, its principal bracts in a single series, equal, with or without a few shorter outer ones. Receptacle flat, naked. Ray-flowers in several series, pistillate, fertile. Disk-flowers perfect, sterile, the corolla 5-cleft, the style undivided and obtuse, lobed. Achenes of the ray-flowers linear, 5–10-ribbed. Pappus copious, of numerous slender roughish bristles, that of the sterile flowers shorter than that of the fertile. [Latin, *tussis*, cough, for which the plant was a reputed remedy.]

A monotypic genus of northern Europe and Asia.

1. Tussilago Fàrfara L. Coltsfoot. Coughwort. (Fig. 4019.)

Tussilago Farfara L. Sp. Pl. 865. 1753.

Scape slender, 3′–18′ high, bearing a solitary large head at the summit. Leaves nearly orbicular, or broadly ovate-reniform, angulately lobed and dentate, 3′–7′ broad, green and glabrous above, persistently white-tomentose beneath; head about 1′ broad; involucre campanulate; rays bright yellow, numerous, linear, pistillate, fertile.

In moist soil, along roadsides, etc., Nova Scotia and New Brunswick to Massachusetts, New York and Minnesota. Naturalized from Europe. Other names are Horse-foot, Horse-hoof, Dove-dock, Sow-foot, Colt-herb, Hoofs, Cleats, Ass's-foot, Bull's-foot, Foal-foot, Ginger, Clay-weed. April-June.

90. PETASÌTES Gaertn. Fr. & Sem. 2: 406. *pl. 166.*

Herbs with perennial thick horizontal rootstocks, broad basal petioled leaves, and scaly scapes bearing racemose or corymbose heads of tubular or both tubular and radiate, white or purplish, often dioecious or subdioecious flowers. Involucre campanulate to cylindric, its bracts in 1 series, equal. Receptacle flat, or nearly so, not chaffy. Corolla of pistillate flowers very slender, 2–5-toothed, truncate or sometimes with a ray, marginal, or composing most of the head; perfect but sterile flowers with a tubular 5-cleft corolla, the style undivided. Anthers entire or minutely sagittate at the base. Fertile achenes linear, the pappus of numerous capillary rough or barbellate bristles. [Greek, a broad-rimmed hat, referring to the broad leaves of these plants.]

About 12 species, natives of the north temperate and subarctic zones.

Flowers whitish, the pistillate radiate; natives; northern.
- Leaves orbicular, 7–11-cleft nearly to the base. 1. *P. palmata.*
- Leaves hastate-reniform, sinuate-lobed or toothed. 2. *P. frigida.*
- Leaves deltoid-ovate, repand-denticulate. 3. *P. sagittata.*

Flowers all rayless, purple; introduced. 4. *P. Petasites.*

1. Petasites palmàta (Ait.) A. Gray. Palmate-leaf Sweet Coltsfoot. (Fig. 4020.)

Tussilago palmata Ait. Hort. Kew. 2: 188. *pl. 2.* 1789.
Nardosmia palmata Hook. Fl. Bor. Am. 1: 308. 1833.
Petasites palmata A. Gray in Brew. & Wats. Bot. Cal. 1: 407. 1876.

Scape very scaly, stout, 6′–24′ high. Leaves nearly orbicular in outline, 3′–12′ broad, deeply 7–11-cleft to much beyond the middle, green and glabrous above, densely white-tomentose beneath, at least when young, sometimes becoming glabrate, the lobes oblong or obovate, acute, often somewhat cuneate, sharply dentate or incised; heads mostly dioecious, corymbose or racemose-corymbose, numerous, 4″–6″ broad; flowers nearly white, fragrant, the marginal ones of the pistillate heads radiate.

In swamps and along streams, Newfoundland to Alaska and British Columbia, south to Massachusetts, New York, Wisconsin and California. April-June.

2. Petasites frígida (L.) Fries. Arctic Sweet Coltsfoot. (Fig. 4021.)

Tussilago frigida L. Sp. Pl. 865. 1753.
Petasites frigida Fries. Summa Veg. Scand. 182. 1845.

Scape very scaly, 3′–10′ high. Leaves hastate-reniform to triangular-ovate, 1′–4′ long, irregularly and angulately lobed and incised, green and glabrous above, persistently white-tomentose beneath, the lobes entire or few-toothed; heads usually fewer and larger than those of the preceding species; involucre short-campanulate; flowers nearly white, fragrant, the marginal ones of the pistillate heads radiate.

Lake Winnipeg (according to Richardson), to the Arctic Sea, west to Alaska and the mountains of British Columbia. Also in northern Europe and Asia. June–Aug.

3. Petasites sagittàta (Pursh) A. Gray. Arrow-leaf Sweet Coltsfoot. (Fig. 4022.)

Tussilago sagittata Pursh, Fl. Am. Sept. 332. 1814.
Nardosmia sagittata Hook. Fl. Bor. Am. 1: 307. 1833.
Petasites sagittata A. Gray in Brew. & Wats. Cal. Bot. 1: 407. 1876.

Scape and racemose-corymbose inflorescence similar to those of the two preceding species. Leaves deltoid-ovate or reniform-ovate, persistently white-tomentose beneath, glabrous or nearly so above, 4′–10′ long, their margins sinuate denticulate, neither cleft nor lobed; involucre campanulate; flowers nearly white, the marginal ones of the pistillate heads radiate.

In wet ground, Hudson Bay to Manitoba and Minnesota, west to British Columbia, south in the Rocky Mountains to Colorado. May-June.

4. Petasites Petasìtes (L.) Karst. Butter-bur. Butterfly-dock. (Fig. 4023.)

Tussilago Petasites L. Sp. Pl. 866. 1753.
Petasites officinalis Moench. Meth. 568. 1794.
Petasites vulgaris Desf. Fl. Atlant. 2: 270. 1798.
P. Petasites Karst. Deutsch. Fl. 1062. 1880-83.

Scape very scaly, 6′–15′ high. Leaves orbicular or hastate-reniform, often 12′ broad when mature, rounded or pointed at the apex, repand-denticulate all around, persistently white-tomentose beneath, green and mostly glabrous above; heads 4″–6″ broad, mostly dioecious, in a dense raceme, the staminate ones smaller than the pistillate; flowers pink-purple, fragrant, none of them radiate.

In cultivated and waste ground, Bucks Co. to Delaware Co., Pa. Naturalized from Europe. Native also of northern Asia. Other names are Batter-, Butter- or Flea-dock, Bog- or Poison-rhubarb, Eldin, Gallon, Umbrella-leaves, Pestilence-wort, Ox-wort. April.

91. ÁRNICA L. Sp. Pl. 884. 1753.

Erect, simple or little branched herbs, with opposite leaves, or the upper rarely alternate, and large, long-peduncled heads of both tubular and radiate, yellow flowers, or rays wanting in some species. Involucre turbinate or campanulate, its bracts in 1 or 2 series, narrow, nearly equal. Receptacle flat, naked, fimbrillate or villous. Ray-flowers pistillate, fertile, the rays spreading, entire, or 2–3-toothed. Disk-flowers perfect, fertile, the corolla 5-lobed, the style with slender branches. Anthers entire or minutely 2-auriculate at the base. Achenes linear, 5–10-ribbed, more or less pubescent. Pappus a single series of rough or barbellate rigid slender bristles. [Derivation uncertain, perhaps from Ptarmica.]

About 20 species, natives of the northern hemisphere. Besides the following, some 11 others occur in the western parts of North America.

Basal leaves ovate or oval, sessile; southern. 1. *A. acaulis.*
Basal leaves oblong, lanceolate, or cordate-ovate, petioled.
  Basal leaves cordate-ovate. 2. *A. cordifolia.*
  Basal leaves not cordate, tapering to the petiole.
    Stem-leaves 3–5 pairs; upper somewhat smaller. 3. *A. Chamissonis.*
    Stem-leaves 1–3 pairs; upper much smaller. 4. *A. alpina.*

1. Arnica acaùlis (Walt.) B.S.P. Leopard's-bane. (Fig. 4024.)

Doronicum acaule Walt. Fl. Car. 205. 1788.
Arnica Claytoni Pursh, Fl. Am. Sept. 527. 1814.
Arnica nudicaulis Nutt. Gen. 2: 164. 1818.
Arnica acaulis B.S.P. Prel. Cat. N. Y. 30. 1888.

Glandular-hirsute; stem 1°–3° high, bearing several slender-peduncled heads at the summit. Basal leaves tufted, ovate or oval, obtuse, narrowed to a sessile base, denticulate or entire, 2′–5′ long, 1½′–3′ wide; stem-leaves 1–3 pairs, and some alternate, very small ones above; heads 1′–1½′ broad; bracts of the involucre linear-lanceolate, acute or acutish; rays 12–15, commonly 3-toothed at the truncate apex; achenes pubescent when young, glabrous or nearly so when mature.

In low woods, Delaware and southern Pennsylvania to Florida. April–May.

2. Arnica cordifòlia Hook. Heart-leaf Arnica. (Fig. 4025.)

Arnica cordifolia Hook. Fl. Bor. Am. 1: 331. 1833.

Hirsute, or pubescent; stem simple, or sparingly branched, 1°–2° high. Basal and lower leaves ovate to nearly orbicular, obtuse or acute, deeply cordate at the base, dentate, 1′–3′ long, with slender sometimes margined petioles; stem-leaves 1–3 pairs, ovate to oblong, sessile or short-petioled, much smaller; heads 1–8, 2′–3′ broad; bracts of the involucre acute or acuminate, 6″–10″ long; rays 12–16, toothed at the apex; achenes hirsute-pubescent, or glabrous at the base.

Western Nebraska to the Northwest Territory, west to Nevada and British Columbia. May–July.

3. Arnica Chamissònis Less. Chamisso's Arnica. (Fig. 4026.)

Arnica Chamissonis Less. Linnaea, 6: 317. 1831.
Arnica mollis Hook. Fl. Bor. Am. 1: 331. 1833.

Villous-pubescent; stem simple, or little branched, 1°–2½° high, bearing 1–6 heads at the summit. Leaves oblong or oblong-lanceolate, dentate or entire, acute or obtuse, 2′–5′ long, 3″–9″ wide, the lower and basal ones narrowed into petioles, the upper sessile, and usually somewhat connate by a broad or narrowed base, those of the stem 3–5 pairs, usually with some alternate small ones on the branches; heads 1′–2′ broad; bracts of the involucre acute; rays 10–15, 3-toothed; achenes hirsute-pubescent.

Mountains of northern New York, New Hampshire and Maine to New Brunswick, west to Lake Superior, Alaska and California, south in the Rocky Mountains to Utah and Colorado. June–Aug.

4. Arnica alpìna (L.) Olin. Mountain Tobacco. Arctic Leopard's-bane. Arctic Arnica. (Fig. 4027.)

Arnica montana var. *alpina* L. Sp. Pl. 884. 1753.
Arnica alpina Olin, Mon. Arn. Upsala. 1799.
Arnica angustifolia Vahl, Fl. Dan. *pl. 1524.* 1814.

Similar to the preceding species, but smaller and more slender, 6′–15′ high, villous or pubescent. Stem simple, usually bearing but a single head, but sometimes with 1–3 additional ones from the axils of the upper leaves; leaves lanceolate, linear-oblong, or the lowest spatulate, thickish, entire or denticulate, 3-nerved, the basal ones petioled, those of the stem 1–3 pairs, sessile or short-petioled, scarcely connate, the upper pair usually much smaller than the lower ones; heads about 2′ broad; rays 10–15, toothed; achenes hirsute or glabrate.

Labrador to Greenland and the Arctic Sea, west to Manitoba (according to Macoun), Alaska and British Columbia, south in the Sierra Nevada to California and in the Rocky Mountains to Colorado. Also in northern Europe. May–Sept.

92. ERECHTÌTES Raf. Fl. Ludov. 65. 1817.

Erect, usually branching herbs, with alternate leaves, and (in our species) rather large discoid many-flowered heads of whitish flowers, corymbose-paniculate at the ends of the stem and branches. Involucre cylindric, swollen at the base, its principal bracts in 1 series, linear, with or without some much smaller outer ones. Receptacle concave, naked. Marginal flowers in 2–several series, pistillate, fertile, their corollas filiform, the limb 2–4-toothed. Central flowers perfect, fertile; corolla narrowly tubular, the limb 4–5-toothed, the style-branches elongated, truncate or obtuse at the summit. Anthers obtuse and entire at the base. Achenes linear-oblong, angled or striate. Pappus of copious capillary soft smooth white bristles. [Ancient name of some groundsel.]

About 12 species, natives of America and Australasia. The following is the only one known to occur in North America.

1. Erechtites hieracifòlia (L.) Raf. Fire-weed. Pilewort. (Fig. 4028.)

Senecio hieracifolius L. Sp. Pl. 866. 1753.
Erechtites hieracifolia Raf. DC. Prodr. 6: 294. 1837.

Annual, glabrous, or somewhat hirsute; stem striate, succulent, usually branched, 1°–8° high. Leaves thin, lanceolate or ovate-lanceolate, dentate and often deeply incised, 2′–8′ long, the upper sessile or auriculate-clasping, mostly acuminate, the lower usually narrowed into petioles; heads 6″–10″ long, about 3″ in diameter, the involucre conspicuously swollen at the base before flowering, its bracts numerous, striate, green, with narrow scarious margins; pappus bright white.

In woodlands, thickets and waste places, very abundant after fires, Newfoundland to Florida, west to the Northwest Territory, Nebraska and Louisiana. Also in Mexico and South America. July–Sept.

93. MESADÈNIA Raf.; Loud. Gard. Mag. 8: 247. 1832.

Tall perennial mostly glabrous herbs, with alternate petioled leaves and numerous, rather small, corymbose, discoid heads of white, yellowish or pinkish flowers, all tubular and perfect. Sap milky (at least in some species). Involucre cylindric or nearly so, its principal bracts 5, in 1 series, equal, usually with a few short outer ones. Receptacle flat, not chaffy, with a fleshy projection in the centre. Corollas with somewhat spreading 5-cleft limbs, the lobes usually with a mid-nerve. Style-branches conic or obtuse at the apex. Achenes oblong, glabrous. Pappus of copious white scabrous bristles. [Greek, referring to the central projection of the receptacle.]

About 12 species, natives of North and Central America. Besides the following, 4 others occur in the southern and southwestern parts of the United States.

Leaves thin, reniform or fan-shaped, lobed, or angulate-dentate.
- Leaves green both sides, angulate-dentate. 1. *M. reniformis.*
- Leaves glaucous beneath, green above, angulate-lobed. 2. *M. atriplicifolia.*

Leaves thick, green both sides, ovate or oval, entire, or repand. 3. *M. tuberosa.*

1. Mesadenia renifórmis (Muhl.) Raf. Great Indian Plantain. Wild Collard. (Fig. 4029.)

Cacalia reniformis Muhl.; Willd. Sp. Pl. 3: 1735. 1804.
Mesadenia reniformis Raf. New Fl. 4: 79. 1836.

Glabrous; stem angled and grooved, 4°–10° high. Leaves thin, green both sides, coarsely angulate-dentate with mucronate-pointed teeth, the basal and lower reniform, long-petioled, sometimes 2° wide, the upper ovate or fan-shaped, mostly cuneate at the base, the uppermost small and oblong; heads numerous, mostly 5-flowered, about 2″ broad, in large compound corymbs; involucre 3″–4″ high, its bracts about 5, linear-oblong, obtuse or acutish, scarious-margined, with or without 1–3 minute outer ones.

In woods, New Jersey and Pennsylvania to Minnesota, south to North Carolina and Tennessee. July–Sept.

2. Mesadenia atriplicifòlia (L.) Raf. Pale Indian Plantain. (Fig. 4030.)

Cacalia atriplicifolia L. Sp. Pl. 835. 1753.
Senecio atriplicifolius Hook. Fl. Bor. Am. 1: 332. 1833.
Mesadenia atriplicifolia Raf. New Fl. 4: 79. 1836.

Stem terete, glabrous and glaucous, 3°–6° high. Leaves thin, angulate-lobed, glaucous beneath, the lower and basal ones slender-petioled, sometimes 6′ wide, the upper reniform, fan-shaped, or triangular with a nearly truncate base, the uppermost commonly small, lanceolate or oblong and entire; heads very numerous, about 1½″ broad, in large loose compound corymbs; involucre 3″–4″ high, its bracts about 5, linear-oblong, scarious-margined, with or without 1–3 minute outer ones.

In woods, western Ontario to Minnesota, south to Florida, Missouri and Kansas. Rare or absent near the coast. Called also Wild Caraway. July-Sept.

3. Mesadenia tuberòsa (Nutt.) Britton. Tuberous Indian Plantain. (Fig. 4031.)

Cacalia tuberosa Nutt. Gen. 2: 138. 1818.
Mesadenia plantaginea Raf. New Fl. 4: 79. 1836.
Senecio Nuttallii Sch. Bip. Flora, 27: 499. 1845.

Glabrous and green throughout; stem angled, stout, 2°–6° high. Leaves thick, strongly 5–9-nerved, the lower and basal ones oval, ovate, or ovate-lanceolate, obtuse or acutish, usually quite entire, but sometimes repand, long-petioled, narrowed at the base, or rarely subcordate, 4′–8′ long, 1′–3′ wide; upper leaves ovate to oblong or cuneate-obovate, sessile or short-petioled, much smaller, sometimes toothed toward the apex; heads very numerous in a compound corymb, about 2″ broad, mostly 5-flowered; involucre 3″–4″ high, its bracts linear-oblong, obtuse or obtusish, scarious-margined.

On wet prairies and in marshes, Ohio and western Ontario to Minnesota, south to Alabama, Louisiana and Arkansas. June–Aug.

94. SYNÓSMA Raf.; Loud. Gard. Mag. 8: 247. 1832.

A perennial leafy herb, glabrous or very nearly so, with triangular or hastate, alternate leaves, the lower petioled, the upper sessile, and several or numerous, corymbose or corymbose-paniculate, discoid heads of white or pinkish flowers. Involucre nearly cylindric, its principal bracts 12–15, linear, acute, usually with some subulate outer ones. Receptacle flat, naked. Flowers perfect; corolla 5-lobed. Style-branches not appendaged. Pappus of very numerous white soft capillary bristles. [Greek, perhaps signifying a fragrant composite.]

A monotypic genus of eastern North America.

1. Synosma suavèolens (L.) Raf.
Sweet-scented Indian Plantain. (Fig. 4032.)

Cacalia suaveolens L. Sp. Pl. 835. 1753.
Senecio suaveolens Ell. Bot. S. C. & Ga. 2: 328. 1821–24.
Synosma suaveolens Raf.; Loud. Gard. Mag. 8: 247. 1832.

Glabrous or very nearly so throughout; stem striate, 3°–5° high, leafy to the inflorescence. Leaves triangular-lanceolate or hastate, sharply and irregularly serrate, acuminate, 4′–10′ long, 2′–6′ wide at the base, the auricles sometimes with 1 or 2 lobes on the lower side; petioles margined, or those of the basal leaves naked and slender; uppermost leaves sometimes merely lanceolate and sessile; heads 2″–3″ broad in a usually large and compound corymb; involucre 4″–6″ high, its principal bracts linear, acute; heads 20–30-flowered.

In woods, Connecticut and New Jersey to Illinois and Minnesota, south to Florida, West Virginia and Kentucky. Called also Wild Caraway. Aug.–Oct.

95. SENÈCIO L. Sp. Pl. 866. 1753.

Annual or perennial herbs (some tropical species shrubby or even arborescent), with alternate or basal leaves, and solitary corymbose or paniculate many-flowered heads, of both tubular and radiate, or only tubular flowers, in our species yellow. Involucre cylindric or campanulate, its principal bracts in 1 series, distinct, or united at the base, usually with some shorter outer ones. Receptacle flat or slightly convex, mostly naked, often honeycombed. Rays, when present, pistillate, fertile. Disk-flowers perfect, fertile, their corollas tubular, the limb 5-toothed or 5-lobed. Anthers obtuse and entire at the base, or rarely slightly sagittate. Style-branches of the disk-flowers usually recurving or spreading. Achenes terete, or those of the marginal flowers somewhat compressed, 5–10-ribbed, papillose or canescent, at least after wetting, and then usually emitting a pair of spiral threads. Pappus of numerous slender or capillary, smooth or rough, mostly white bristles. [Latin, *senex*, an old man, referring to the hoary character of some species, or to the white pappus.]

An immense genus of probably at least 1000 species, of very wide geographic distribution. In addition to the following, some 50 others occur in the southern and western parts of North America. Our species known as Groundsel, Ragwort, or Squaw-weed.

* Heads conspicuously radiate (except in forms of Nos. 9, 10 and 15).

(a) Heads solitary or few, 6″–12″ high; northern species.

Stout; leaves 4′–8′ long; heads 1½′–2′ broad. 1. *S. Pseudo-Arnica.*
Low; leaves 1′–2′ long; heads ½′–1′ broad. 2. *S. frigidus.*

(b) Heads several or numerous, corymbose, mostly smaller.

† At least the lowest leaves entire or dentate, not pinnatifid (or sometimes pinnatifid in No. 7).

‡ None of the leaves cordate.

Heads 5″–7″ high; plants 1°–5° tall; northwestern species.
Involucral bracts acuminate; leaves mostly entire. 3. *S. integerrimus.*
Bracts acute or obtuse, mostly black-tipped; leaves denticulate. 4. *S. lugens.*
Heads 3″–5″ high; plants 6′–30′ tall.
Leaves and stems persistently more or less tomentose or woolly.
Achenes glabrous. 5. *S. canus.*
Achenes hispidulous or glandular.
Basal leaves long-petioled, crenate-dentate or sometimes pinnatifid; plants tall.
Basal leaves crenate-dentate; eastern. 6. *S. tomentosus.*
Stem leaves and often also the basal, pinnatifid; western. 7. *S. Platensis.*
Basal leaves short-petioled, much tufted, oval, few-toothed, or entire; plant low. 8. *S. antennariifolius.*
Leaves glabrous or nearly so; stem often woolly, especially below.
Basal leaves obovate, spatulate, or oval; achenes glabrous.
Basal leaves obovate or suborbicular, crenate or dentate; involucral bracts 2–2½ long. 9. *S. obovatus.*
Basal leaves ovate to oval; involucral bracts 3′–5′ long. 10. *S. discoideus.*
Basal leaves oblong; achenes hispidulous.
Heads few or several, 3″–4″ high; basal leaves 1′–3′ long. 11. *S. Balsamitae.*
Heads numerous, 2″–2½″ high; basal leaves 3′–6′ long. 12. *S. Smallii.*
Basal leaves linear-cuneate, entire or 3-toothed at apex. 13. *S. compactus.*

‡ ‡ Basal leaves cordate or subcordate; plants mostly glabrous.

Basal leaves lanceolate or oblong-lanceolate. 14. *S. Robbinsii.*
Basal leaves orbicular or ovate-oval. 15. *S. aureus.*
†† Leaves narrowly linear, entire, or with linear, entire lobes. 16. *S. Douglasii.*
††† Leaves all pinnatifid or coarsely sinuate-dentate; plants glabrous, or somewhat woolly when young.
Leaves sinuate-dentate, lanceolate; heads 4″–5″ high. 17. *S. palustris.*
Leaves pinnately divided; segments entire or dentate; heads 2′–3′ high. 18. *S. lobatus.*
Leaves 2-pinnatifid; heads 3″ high; introduced species. 19. *S. jacobaea.*

* * Heads discoid, the rays none, or minute.

Leaves pinnatifid; plants glabrous or puberulent; achenes canescent.
Heads 3″–4″ high; involucre naked, or nearly so at the base. 20. *S. lyratifolius.*

Heads 4″–6″ high; involucre with several short outer bracts. Leaves pinnatifid; plant viscid-pubescent; achenes glabrous. Basal leaves obovate, orbicular, or spatulate, merely dentate.
21. *S. vulgaris*.
22. *S. viscosus*.
Varieties of Nos. 9, 10 and 15.

1. Senecio Pseùdo-Árnica Less. Seabeach Senecio. (Fig. 4033.)

Arnica maritima L. Sp. Pl. 884. 1753. Not *S. maritimus* L.
Senecio Pseudo-Arnica Less. Linnaea, 6: 240. 1831.

Perennial, somewhat fleshy; stem stout, mostly simple, very leafy, 6′–3° high. Leaves oblong-obovate, or the lower spatulate, acute or obtuse at the apex, 4′–8′ long, ½′–2′ wide, densely tomentose beneath, at least when young, repand-dentate or denticulate, narrowed to a sessile and partly clasping base, or the lowest into margined petioles; heads solitary, or several (2–7) and corymbose, stout-peduncled, 1½′–2′ broad, nearly 1′ high; involucre broadly campanulate, its bracts lanceolate, acuminate, mostly tomentose, commonly with several subulate spreading ones at the base; rays 12–15, linear, 3-toothed, conspicuous; disk-corollas 5-lobed; achenes glabrous; pappus dull.

On sea-beaches and rocks near the sea, Maine, New Brunswick and the lower St. Lawrence to Labrador and the Arctic Sea. Also in Alaska and northern Asia. July–Aug.

2. Senecio frígidus Less. Arctic Senecio. (Fig. 4034.)

Senecio frigidus Less. Linnaea, 6: 239. 1831.

Perennial, more or less tomentose, or becoming glabrous when old; stem slender, 6′–12′ high, bearing a solitary head (rarely 2 or 3) ½′–1′ broad. Basal and lower leaves spatulate or obovate, 1′–2′ long, petioled, obtuse, repand-dentate or entire; stem-leaves oblong to linear-lanceolate, obtuse or acute, sessile, mostly entire, smaller; involucre broadly campanulate, its bracts lanceolate, acute, with no exterior smaller ones; rays 10–16, 6″–10″ long, 3-toothed, linear-oblong, or cuneate at the base; achenes glabrous or sparingly pubescent; pappus white.

Labrador and arctic America to Alaska. Also in northeastern Asia. Summer.

3. Senecio integérrimus Nutt. Entire-leaved Groundsel. (Fig. 4035.)

Senecio integerrimus Nutt. Gen. 2: 165. 1818.

Perennial, more or less woolly when young, glabrous or nearly so when old; stem stout, 1°–4° high. Leaves entire, or sparingly denticulate, somewhat fleshy, the lower and basal ones oval or oblong, obtuse or obtusish at the apex, 3′–6′ long, 1′–1½′ wide, petioled, the upper linear or lanceolate, acute, the uppermost very small; heads numerous, corymbose, long-peduncled, 6″–10″ broad; involucre nearly cylindric, 4″–5″ high, its principal bracts linear, acuminate, green, usually with a few subulate outer ones; rays 8–12, linear-oblong; achenes nearly glabrous, pappus white.

Minnesota and Manitoba to Wyoming and British Columbia. June–July.

4. Senecio lùgens Richards. Black-tipped Groundsel. (Fig. 4036.)

Senecio lugens Richards. App. Frankl. Journ. Ed. 2: 31. 1823.

Similar to the preceding species, more or less woolly when young, soon glabrous; stem stout, 1°–3° high. Basal and lower leaves oblong, oval, or slightly spatulate, obtuse or acute, denticulate or dentate, 2′–5′ long, ½′–1½′ wide, narrowed into margined petioles; upper leaves few, sessile, small and bract-like; heads several or numerous, corymbose, often short-peduncled, 6″–10″ broad; involucre campanulate, 3″–4″ high, its bracts lanceolate or oblong-lanceolate, acute or obtuse, often with conspicuous black tips; rays 10–12, oblong-linear; achenes glabrous; pappus white.

In moist soil, arctic America and the Northwest Territory to Minnesota, Iowa and Nebraska, west to Alaska and California. June–Aug.

5. Senecio cànus Hook. Silvery Groundsel. (Fig. 4037.)

S. canus Hook. Fl. Bor. Am. 1: 333. *pl. 116.* 1833.

Perennial, densely and persistently white-tomentose to the inflorescence; stems slender, usually tufted, 6′–18′ high. Basal and lower leaves spatulate or oval, entire, or rarely somewhat repand, very obtuse, 1′–2′ long, narrowed into petioles; upper leaves oblong or spatulate, obtuse or acute, mostly sessile, smaller, entire or dentate; heads several or numerous, 8″–10″ broad, usually slender-peduncled; involucre campanulate, or at first short-cylindric; about 5″ high, its bracts linear-lanceolate, acute sparingly tomentose, or glabrate, usually with no exterior smaller ones; rays 8–12; achenes glabrous, at least below; pappus white.

In dry soil, Manitoba to Minnesota and Nebraska, west to British Columbia and California. May–Aug.

6. Senecio tomentòsus Michx. Woolly Ragweed. Ashwort. (Fig. 4038.)

S. tomentosus Michx. Fl. Bor. Am. 2: 119. 1803.

Perennial, more or less densely and persistently tomentose or woolly-canescent; stems rather stout, solitary, or sometimes tufted, 1°–2½° high. Basal and lower leaves ovate-lanceolate, oblong or rarely spatulate, long-petioled, erect, very obtuse, 2′–6′ long, ½′–2′ wide, crenate-dentate, narrowed or truncate at the base; stem-leaves few and distant, small, linear-lanceolate or spatulate, crenate or rarely laciniate; heads several or numerous, corymbose, mostly long-peduncled, 8″–10″ broad; involucre cylindric, or narrowly campanulate, its bracts linear-lanceolate, acute or acuminate, at length glabrate, with or without a few small outer ones; rays 10–15; achenes hispidulous, at least on the angles; pappus white.

In moist soil, southern New Jersey to Florida, west to Louisiana. April–June.

7. Senecio Platténsis Nutt. Prairie Ragwort. (Fig. 4039.)

S. Plattensis Nutt. Trans. Am. Phil. Soc. (II) 7: 413. 1841.

Perennial, similar to the preceding species, usually smaller-leaved, lower and less tomentose, or becoming glabrate in age, seldom over 1½° high. Basal leaves oval, ovate or oblong, some or all of them more or less pinnatifid, with the terminal segment much larger than the lateral ones, crenulate or dentate, long-petioled; heads several or numerous, compactly or loosely corymbose, conspicuously radiate.

Illinois to South Dakota, Nebraska and the Indian Territory. April–June.

8. Senecio antennariifòlius Britton. Cat's-paw Ragwort. (Fig. 4040.)

Perennial, tufted in mostly large clumps; stems slender, 8′–18′ high, loosely white-woolly. Leaves nearly all basal, commonly numerous, oval to spatulate, angulately few-toothed or entire, mostly obtuse, narrowed into a petiole as long as the blade or longer, densely white-tomentose beneath, green and finally glabrous above, 1′–2½′ long; stem-leaves small, spatulate, laciniate, or the upper narrowly linear and entire; heads several, corymbose, slender-peduncled, rather less than 1′ broad; rays golden yellow, showy; involucre 3″ high, white-woolly; achenes glandular-pubescent.

White Sulphur Springs, West Virginia, on a loose slate hillside, T. F. Allen and N. L. Britton, May 16, 1897; Blue Ridge, Virginia, S. B. Buckley, 1838.

9. Senecio obovàtus Muhl. Round-leaf Squaw-weed. (Fig. 4041.)

Senecio obovatus Muhl.; Willd. Sp. Pl. 3: 1999. 1804.
Senecio Elliottii T. & G. Fl. N. A. 2: 443. 1843.
S. aureus var. *obovatus* T. & G. loc. cit. 442. 1843.

Perennial; stems commonly several from the same root, glabrous, or a little woolly at the base, 9′–24′ high. Leaves glabrous, rather thick, the basal ones obovate with a cuneate base, or spatulate, very obtuse and rounded at the apex, 1′–3½′ long, ½′–2′ wide, crenate-dentate, often purplish, usually with short margined petioles, or the earliest sessile; stem-leaves commonly few and sessile, spatulate to oblong, often incised or pinnatifid, the uppermost very small; heads several, corymbose, 6″–8″ broad, about 3″ high, slender-peduncled; involucre nearly cylindric, its principal bracts linear-lanceolate, 2″–3″ long, acute, usually with 1–3 small exterior ones; rays 8–12, usually conspicuous, achenes glabrous; pappus white.

In moist soil and on banks, Nova Scotia to Florida, west to Ontario, Michigan, Kentucky and Missouri. April–June.

Senecio obovàtus elongàtus (Pursh) Britton.

Senecio elongatus Pursh, Fl. Am. Sept. 529. 1814.

Stem slender, weak; leaves, or some of them, with tufts of wool in their axils; heads few, rayless or short-rayed, often long-peduncled. On moist shaded banks, eastern Pennsylvania.

Senecio obovàtus rotúndus Britton.

Basal leaves orbicular, broadly oval, or ovate-orbicular, rather abruptly narrowed into the petiole, the larger 2½′–3′ broad. On wet banks, or rocks, Kentucky to Missouri and the Indian Territory.

10. Senecio discòideus (Hook) Britton. Northern Squaw-weed. (Fig. 4042.)

Senecio aureus var. *discoideus* Hook. Fl. Bor. Am. 1: 333. 1833.

Perennial, glabrous except for small tufts of wool in the axils of the lower leaves; stem rather stout, 1°–2° tall; basal leaves oval to ovate, obtuse, thin, sharply dentate, abruptly narrowed into petioles longer than the blade; stem-leaves few, small, more or less laciniate; heads few or several, slender-peduncled, corymbose; bracts of the involucre narrowly linear, 3″–5″ long; rays very short, or none; achenes glabrous.

In moist places, Michigan to the Northwest Territory. June–Aug.

11. Senecio Balsámitae Muhl. Balsam Groundsel. (Fig. 4043.)

Senecio Balsamitae Muhl.; Willd. Sp. Pl. 1999. 1804. *Senecio aureus* var. *Balsamitae* T. & G. Fl. N. A. 2: 442. 1843.

Perennial, often tufted, stems slender, 10′–20′ high, woolly at the base and in the axils of the lower leaves. Basal leaves slender-petioled, oblong, rarely slightly spatulate, very obtuse, narrowed at the base, mostly thick, crenate, often purplish, 1′–3′ long, 3″–6″ wide, their petioles and sometimes their lower surfaces persistently tomentose or woolly, or glabrous throughout; lower stem-leaves petioled, laciniate or pinnatifid, the upper sessile, very small; heads few or several, slender-peduncled, 6″–10″ broad, 3″–4″ high; rays 8–12; achenes usually hispidulous on the angles; pappus white.

In dry or rocky soil, Nova Scotia to North Carolina, west to Washington, British Columbia, Texas and Nebraska. May–July.

12. Senecio Smàllii Britton. Small's Squaw-weed. (Fig. 4044.)

S. aureus var. *angustifolius* Britton, Mem. Torr. Club, 2: 39. 1890. Not *S. angustifolius* Willd. 1804.
S. Smallii Britton, Mem. Torr. Club, 4: 132. 1893.

Similar to the preceding species but taller, growing in large clumps. Stem 1½°–2½° high, slender, densely and persistently floccose-woolly at the base and in the lower axils, or finally glabrate; basal leaves elongated-oblong or linear-oblong, obtuse or acute, long-petioled, crenate-dentate, 3′–6′ long, 3″–9″ wide, at first tomentose, at length nearly glabrous; stem-leaves several, deeply pinnatifid, or the lower lyrate, the uppermost very small; heads very numerous, 4″–5″ broad, about 2½″ high, slender-peduncled, forming large corymbs; rays 8–10; achenes hispidulous; pappus white.

In meadows and thickets, mountains of Virginia and North Carolina. May–June.

13. Senecio compáctus (A. Gray) Rydberg. Western Squaw-weed. (Fig. 4045.)

Senecio aureus var. *compactus* A. Gray, Syn. Fl. 1: Part 2, 391. 1884.

Senecio compactus Rydberg, Mem. Torr. Club, 5: 342. 1893.

Perennial; stem usually tufted, low, rather stout, 6′–12′ high, woolly at the base and in the lower axils, or glabrous. Basal leaves linear-cuneate, entire or 3-toothed at the apex, 1′–3′ long, 2″–3″ wide, thick, slender-petioled, the petioles commonly woolly-margined; lower stem-leaves often much larger and broader, usually laciniate or pinnatifid, but sometimes similar to the basal, the uppermost very small and sessile; heads several, 8″–10″ broad, short-peduncled in a compact corymb; rays 10–15; achenes hispidulous; pappus white.

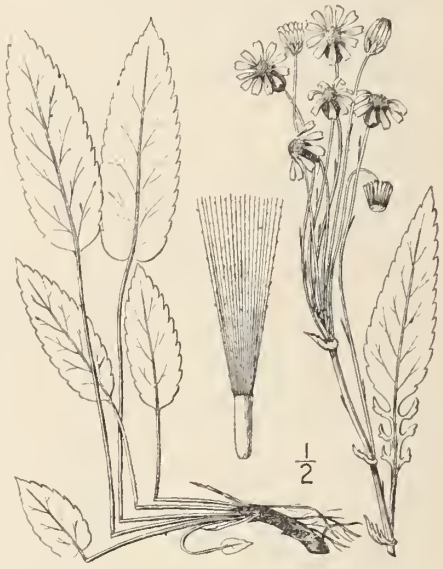
On dry plains, Nebraska and Colorado to Texas. May–June.

14. Senecio Robbínsii Oakes. Robbins' Squaw-weed. (Fig. 4046).

Senecio Robbinsii Oakes; Rusby, Bull. Torr. Club, 20: 19. 1893.

Perennial, glabrous or very nearly so throughout; stems slender, 1°–2½° high. Basal leaves long-petioled, lanceolate, obtuse oracute at the apex, cordate, subcordate or truncate at the base, usually thin, 2′–4′ long, ½′–1¼′ wide, sharply dentate; heads several or numerous, slender-peduncled in an open corymb, 8″–10″ broad; rays 6–12; achenes glabrous; pappus white.

In swamps and mountain meadows, northern New Hampshire, Vermont and New York, and on the summit of Roan Mountain, N. C. June–Sept.



15. Senecio aùreus L. Golden Ragwort. Life-root. Swamp Squaw-weed. (Fig. 4047.)

Senecio aureus L. Sp. Pl. 870. 1753.

Perennial, glabrous or very nearly so throughout; stems rather slender, solitary or tufted, 1°–2½° high. Basal leaves cordate-ovate or cordate-orbicular or reniform, crenate-dentate, very obtuse and rounded, often purplish, 1′–6′ long, with long slender petioles; lower stem-leaves lanceolate or oblong, usually laciniate, pinnatifid or lyrate, the uppermost small, sessile, somewhat auriculate and clasping; heads several, 8″–10″ broad, 4″–5″ high, slender-peduncled in an open corymb; rays 8–12, golden-yellow; achenes glabrous; pappus white.

In swamps and wet meadows, Newfoundland to Florida, west to Ontario, Missouri and Texas. Called also Grundy Swallow, False Valerian. Root strong-scented. May–July.

Senecio aùreus pauciflòrus (Pursh) Britton.

Senecio pauciflorus Pursh, Fl. Am. Sept. 529. 1814.

Glabrous or with a little wool in the axils of the lower leaves; stem rather stout, 6′–12′ high; basal leaves ovate to orbicular, about ½′ broad, cordate or subcordate at the base, crenate; stem-leaves few, pinnatifid; heads 1–10, short-peduncled, rather large, apparently always rayless. Perhaps a distinct species. Newfoundland to the Canadian Rocky Mountains.

Senecio aùreus grácilis (Pursh) Britton.
Senecio gracilis Pursh, Fl. Am. Sept. 529. 1814.
Stem slender, 1°–2° high, the lowest axils sometimes woolly. Basal leaves smaller than those of the type, cordate or subcordate; heads numerous, rather small; rays conspicuous. In wet soil, Rhode Island to Michigan, South Dakota, Virginia and Missouri.

16. Senecio Douglásii DC. Douglas' Senecio. (Fig. 4048.)

Senecio Douglasii DC. Prodr. 6: 429. 1837.

Woody at the base, usually branched, sometimes shrubby, glabrous or tomentose, leafy, 1°–6° high. Leaves sessile, or the lowest petioled, mostly thick, 1′–3′ long, pinnately parted into 3–9 linear or filiform entire segments, or the upper, or sometimes all of them, linear and entire; heads corymbose at the ends of the branches, ½′–1′ broad, slender-peduncled; involucre cylindric or becoming campanulate, 4″–6″ high, its bracts linear, acute or acuminate, usually with some subulate exterior ones; rays 8–15; achenes canescent; pappus bright white.

Plains, in dry soil, Nebraska to Texas and Mexico, west to California. June–Sept.

17. Senecio palústris (L.) Hook. Marsh Fleawort. Pale Ragwort. Marsh Groundsel. (Fig. 4049.)

Cineraria palustris L. Sp. Pl. Ed. 2, 243. 1763.
Senecio palustris Hook. Fl. Bor. Am. 1: 334. 1833.

Annual or biennial, pubescent or glabrate; stem stout, simple, hollow, 6′–24′ high. Leaves lanceolate, oblong or spatulate, entire, dentate, or laciniate, acute or obtuse, 2′–7′ long, 3″–15″ wide, or the upper linear-lanceolate and small, those of the stem sessile and somewhat auriculate-clasping, the basal petioled; heads numerous, 6″–12″ broad, mostly short-peduncled in a large, rather dense, terminal corymb; involucre cylindric, becoming campanulate, 3″–4″ high, its bracts linear, acute, more or less pubescent, with no shorter outer ones; rays 15–20, pale-yellow; achenes glabrous; pappus white, elongated, at length twice the length of the involucre.

In swamps, Iowa and Wisconsin to Manitoba and arctic America, west to Alaska. Reported from Labrador. Also in Greenland, northern Europe and Asia. June–Aug.

18. Senecio lobàtus Pers. Butterweed. Cress-leaved Groundsel. (Fig. 4050.)

S. lyratus Michx. Fl. Bor. Am. 2: 120. 1803. Not L. 1753.
Senecio lobatus Pers. Syn. 2: 436. 1807.

Annual, glabrous throughout, or slightly woolly when young, fleshy and tender; stem hollow, simple or branched, 1°–3° high. Leaves 2′–10′ long, pinnately divided, the segments orbicular, oblong, obovate or cuneate, obtuse, sinuate-dentate, entire or lobed, the terminal segment usually larger than the others; lower and basal leaves slender-petioled; heads numerous, 7″–10″ broad, slender-peduncled in terminal corymbs; involucre nearly cyliudric, 2½″ high, its bracts linear, acute, usually with no small outer ones; rays 6–12; achenes minutely hispidulous on some of the angles; pappus white, somewhat longer than the involucre.

In swamps, Missouri and southern Illinois to North Carolina, New Mexico, Mexico and Florida. April–Sept.

19. Senecio Jacobaèa L. Tansy Ragwort. Staggerwort. (Fig. 4051.)

Senecio Jacobaea L.: Sp. Pl. 870. 1753.

Perennial by short thick rootstocks, somewhat woolly, or glabrous; stems stout, simple, or branched above, 2°–4° high, very leafy. Leaves 2-pinnatifid, 2′–8′ long, the lower petioled, the upper sessile, the lobes oblong-cuneate, dentate or incised; heads very numerous, 6″–8″ broad, short-pedunculed in large compact corymb; involucre narrowly campanulate, about 2½″ high, its bracts linear-lanceolate, acute, green, or tipped with black, usually with a few subulate outer ones; rays 12–15; achenes of the disk-flowers pubescent, those of the rays glabrous; pappus white.

In waste places, Nova Scotia, New Brunswick and Ontario, and in ballast about New York and Philadelphia. Adventive from Europe. Called also Staverwort, Cankerweed, Kettle-dock, St. James'-wort, Felon-weed, Fairies' Horse, Ragweed. July–Sept.

20. Senecio sylváticus L. Wood Groundsel. (Fig. 4052.)

Senecio sylvaticus L. Sp. Pl. 868. 1753.

Annual, glabrous or puberulent; stem usually much branched, 1°–2½° high, leafy. Leaves pinnatifid, oblong or lanceolate in outline, the segments oblong or spatulate, obtuse, dentate, lobed or entire, or the uppermost leaves linear and merely dentate; heads several or numerous in the corymbs, slender-peduncled, about 2″ broad, 3″–4″ high; involucre usually quite naked and swollen at the base; rays none, or very short and recurved; achenes canescent; pappus white.

In waste places, Nova Scotia and Prince Edward Island. Also on the coasts of California and British Columbia. Naturalized or adventive from Europe. April–Sept.

21. Senecio vulgàris L. Common Groundsel. (Fig. 4053.)

Senecio vulgaris L. Sp. Pl. 867. 1753.

Annual, puberulent or glabrate; stem hollow, usually much branched, 6′–15′ high. Leaves pinnatifid, 2′–6′ long, the lower spatulate in outline, petioled, obtuse, the upper sessile or clasping at the base, more deeply lobed or incised, their segments oblong, dentate; heads several or numerous in the corymbs, nearly 3″ broad, 4″–6″ high; bracts of the involucre linear, often blackish-tipped, almost always with a few subulate outer ones; rays none; achenes slightly canescent; pappus white.

In cultivated ground and waste places, Newfoundland and Hudson Bay to Virginia, west to Minnesota and Michigan. Also on the Pacific Coast Naturalized from Europe. Other names are Grinsel, Simson, Birdseed, Chickenweed. April–Oct.

22. Senecio viscòsus L. Fetid or Viscous Groundsel. (Fig. 4054.)

Senecio viscosus L. Sp. Pl. 868. 1753.

Annual, viscid-pubescent, strong-scented; stem usually much branched, 1°–2° high. Leaves 1–2-pinnatifid, 1½′–3′ long, oblong or somewhat spatulate in outline, the segments oblong or cuneate, dentate or incised; lower leaves petioled; heads few in the corymbs, 3″–4″ broad, mostly slender-peduncled; involucre nearly cylindric, 4″–5″ high, its bracts linear, acute, usually with 1–3 shorter outer ones; rays commonly about 20, very short, recurved and inconspicuous; achenes glabrous; pappus bright white, about one-third longer than the involucre.

In waste places and on ballast near the coast, New Brunswick to North Carolina. July–Sept.

96. ÀRCTIUM L. Sp. Pl. 816. 1753.

Large coarse branching, rough or canescent, mostly biennial herbs, with broad alternate petioled leaves, and rather large heads of purple or white perfect tubular flowers, racemose, corymbose or paniculate at the ends of the branches. Involucre subglobose, its bracts rigid, lanceolate, tipped with spreading or erect hooked bristles, imbricated in many series. Receptacle flat, densely bristly. Corollas tubular with 5-cleft limbs. Filaments glabrous. Anthers sagittate at the base. Achenes oblong, somewhat compressed and 3-angled, ribbed, truncate. Pappus of numerous short serrulate scales. [Greek, bear, from the rough involucre.]

About 6 species, natives of Europe and Asia.

Bracts densely cottony; heads corymbose. 1. *A. tomentosum.*
Bracts of the involucre glabrous, or slightly woolly.
  Involucre 1′ broad or more; inner bracts equalling or exceeding the flowers. 2. *A. Lappa.*
  Involucre 6″–9″ broad; inner bracts not exceeding the flowers. 3. *A. minus.*

1. Arctium tomentòsum (Lam.) Schk. Woolly or Cottony Burdock. (Fig. 4055.)

Lappa tomentosa Lam. Encycl. 1: 377. 1783.
Arctium tomentosum Schk. Bot. Handb. 3: 49. 1803.
Arctium Lappa var. *tomentosum* A. Gray, Syn. Fl. 1: Part 2, 397. 1884.

Similar to the following species. Heads 8″–10″ broad, corymbose at the ends of the branches, mostly long-peduncled; bracts of the involucre densely cottony, the inner ones erect and somewhat shorter than the flowers.

In waste places, New Brunswick to Massachusetts and southern New York. Adventive from Europe. July–Aug.

2. Arctium Lappa L. Great Bur, Burdock, or Clotbur. (Fig. 4056.)

Arctium Lappa L. Sp. Pl. 816. 1753.
Lappa major Gaertn. Fruct. & Sem. 2: 379. *pl. 162.* 1802.

Stem much branched, 4°–9° high. Leaves thin, broadly ovate, pale and tomentose-canescent beneath, obtuse, entire, repand or dentate, mostly cordate, the lower often 18′ long; petioles solid, deeply furrowed; heads clustered or subcorymbose, sometimes long-peduncled, 1′–1½′ broad; bracts of the involucre glabrous or nearly so, their spines all spreading, the inner ones equalling or exceeding the flowers; corolla-tube longer than the limb.

In waste places, New Brunswick and Ontario to southern New York, and locally in the interior. Not nearly as common as the next species in the Middle States. Naturalized from Europe. Other names are Cockle-bur, Cockle-button, Cuckold-dock, Hurr-bur, Stick-button, Hardock, Bardane, Beggar's Buttons. July-Oct.

3. Arctium minus Schk. Common Burdock. (Fig. 4057.)

Arctium minus Schk. Bot. Handb. 3: 49. 1803.
Lappa minor DC. Fl. Fran. 4: 77. 1805.
Arctium Lappa var. *minus* A. Gray, Syn. Fl. 1: Part 2, 397. 1884.

Smaller than the preceding species, seldom over 5° high. Leaves similar, the lower deeply cordate; petioles hollow, not deeply furrowed; heads numerous, racemose on the branches, short-peduncled or sessile, 6″–9″ broad; bracts of the involucre glabrous or slightly cottony; the spines of the outer ones spreading, those of the inner erect and shorter than the flowers; corolla-tube about as long as the limb.

In waste places, common throughout our area. Naturalized from Europe. Called also Cuckoo Button. Leaves rarely laciniate or pinnatifid. July-Nov.

97. CÀRDUUS L. Sp. Pl. 820. 1753.

Erect, branching or simple, prickly herbs, some species acaulescent, with alternate or basal, sinuate-dentate lobed or pinnatifid, usually very spiny leaves, sometimes decurrent, and large many-flowered, solitary or clustered, discoid heads of purple, yellow or white, tubular, perfect and fertile, or rarely dioecious flowers. Involucre ovoid or globose, its bracts prickle-tipped or unarmed, imbricated in many series. Receptacle flat or convex, bristly. Corolla-tube slender, the limb deeply 5-cleft. Filaments pilose, or rarely glabrous. Anthers sagittate at the base. Style-branches short or elongated, obtuse. Achenes obovate or oblong, compressed or obtusely 4-angled, glabrous, smooth or ribbed. Pappus of several series of slender, plumose, minutely serrulate, or simple bristles, connate at the base. [The ancient Latin name of these plants.]

About 250 species, widely distributed in the northern hemisphere. Besides the following, some 35 others occur in the southern and western parts of North America.

* Pappus-bristles, at least those of the inner flowers, plumose. (Plumed Thistles.)

† Outer involucral bracts, or all of them, strongly prickly-pointed.

1. Leaves glabrous or hispid above, tomentose beneath.

All the bracts of the involucre tipped with prickles; naturalized weed. 1. *C. lanceolatus.*
Outer bracts prickle-tipped, the inner merely acuminate; native species.
Branches leafy up to the heads; involucral bracts firm or rigid.
Leaves undivided, lobed or dentate, rarely pinnatifid. 2. *C. altissimus.*
Leaves deeply pinnatifid into lanceolate or linear segments. 3. *C. discolor.*
Heads naked-peduncled, 1′ high; involucral bracts thin. 4. *C. Virginianus.*

2. Leaves tomentose on both sides, or becoming glabrous above; western.

Leaves pinnately parted; segments linear, entire or lobed. 5. *C. Pitcheri.*
Leaves pinnatifid into triangular or lanceolate dentate segments.
Outer bracts with spines less than one-half their length.
Leaf-lobes triangular; flowers pink or purple. 6. *C. undulatus.*
Leaf-lobes linear-lanceolate to oblong; flowers cream-color. 7. *C. Plattensis.*
Outer bracts with spines of nearly or quite their length. 8. *C. ochrocentrus.*
Leaves entire or undulate; outer pappus-bristles barbellate. 9. *C. Nebraskensis.*

3. Leaves green both sides, somewhat pubescent beneath.

Leaf-lobes acute; bracts of the involucre faintly nerved. 10. *C. odoratus.*
Leaf-lobes blunt; bracts with prominent glutinous midnerve. 11. *C. Hillii.*

†† Bracts of the involucre not at all prickly-pointed, or scarcely so.

Heads large, few, 1′–4′ broad; flowers all perfect and fertile.
Heads involucrate by the upper very spiny leaves; flowers usually yellow. 12. *C. spinosissimus.*
Heads peduncled, naked, or with 1 or 2 bracts at the base; flowers purple. 13. *C. muticus.*
Heads small, numerous, 1′ or less broad; flowers imperfect, dioecious. 14. *C. arvensis.*

** Pappus-bristles simple, or minutely serrulate. (Plumeless Thistles.)

Head solitary, nodding; bracts of the involucre lanceolate. 15. *C. nutans.*
Heads clustered, erect or ascending; bracts linear. 16. *C. crispus.*

1. Carduus lanceolàtus L. Common Bur or Spear Thistle. (Fig. 4058.)

Carduus lanceolatus L. Sp. Pl. 821. 1753.
Cirsium lanceolatum Scop. Fl. Carn. Ed. 2, 2: 130. 1772.
Cnicus lanceolatus Willd. Prodr. Fl. Berol. 259. 1787.

Biennial; stem stout, branched, more or less tomentose, 3°–5° high, leafy to the heads. Leaves dark green, lanceolate, acuminate, deeply pinnatifid, 3′–6′ long, or the lowest larger, decurrent on the stem and branches, the lobes triangular-lanceolate, tipped with stout prickles, the margins and decurrent bases bristly, the upper surface strigose-pubescent or hispid, the lower brown-tomentose and midnerve pilose especially when young; heads mostly solitary at the ends of the branches, 1½′–2′ broad, 1½′–2′ high; bracts of the involucre cottony, narrowly lanceolate, acuminate, all tipped with slender erect or ascending prickles; flowers dark purple.

In fields and waste places, Newfoundland to Georgia, west to Minnesota, Nebraska and Missouri. Naturalized from Europe. Native also of Asia. Other names are Plume, Bank, or Horse Thistle, Bell, Bird, Blue, Button, Bull or Roadside Thistle. July–Nov.

2. Carduus altíssimus L. Tall or Roadside Thistle. (Fig. 4059.)

Carduus altissimus L. Sp. Pl. 824. 1753.
Cnicus altissimus Willd. Sp. Pl. 3: 1671. 1804.
Cirsium altissimum Spreng, Syst. 3: 373. 1826.

Biennial or perennial; roots often thickened; stem pubescent, or tomentose, stout, branched, leafy to the heads, 3°–10° high. Leaves ovate-oblong or oblong-lanceolate, sessile, or slightly clasping, sparingly pubescent above, densely white-tomentose beneath, scarcely or not at all decurrent, acute, spinulose-margined, entire, dentate with bristle-pointed teeth or lobed, sometimes pinnatifid into oblong or triangular-lanceolate segments, the lowest sometimes 8′ long, narrowed into margined petioles, the uppermost linear or lanceolate, much smaller; heads about 2′ broad, 1½′–2′ high, mostly solitary at the ends of the branches; outer bracts of the involucre ovate or ovate-lanceolate, firm, with a dark, slightly glandular spot at the apex, tipped with short prickles, the inner linear-lanceolate, acuminate, unarmed; flowers light purple.

In fields and thickets, Massachusetts to Minnesota, Florida, Nebraska and Texas. Aug.–Sept.

3. Carduus díscolor (Muhl.) Nutt. Field Thistle. (Fig. 4060.)

Cnicus discolor Muhl.; Willd. Sp. Pl. 3: 1670. 1804.
Carduus discolor Nutt. Gen. 2: 130. 1818.
Cirsium discolor Spreng. Syst. 3: 373. 1826.
Cnicus altissimus var. *discolor* A. Gray, Proc. Am. Acad. 19: 57. 1883.

Similar to the preceding species, but lower and more leafy, seldom over 7° high. Leaves deeply pinnatifid into linear, linear-lanceolate, or falcate, prickly toothed segments, white tomentose beneath, sessile, the basal ones sometimes 12′ long; heads 1½′–2′ broad, about 1½′ high, usually involucrate by the upper leaves, mostly solitary at the ends of the branches; outer bracts of the involucre coriaceous, ovate, slightly woolly, tipped with slender bristles, which are longer than those of the preceding species; inner bracts lanceolate, acuminate, unarmed; flowers light purple or pink, rarely white.

In fields and along roadsides, Quebec and Ontario to Georgia, Minnesota, Nebraska and Missouri. July–Nov.

4. Carduus Virginiànus L. Virginia Thistle. (Fig. 4061.)

Carduus Virginianus L. Sp. Pl. 824. 1753.
Cirsium Virginianum Michx. Fl. Bor. Am. 2: 90. 1803.
Cnicus Virginianus Pursh, Fl. Am. Sept. 506. 1814.

Biennial; stem slender, naked or scaly above, pubescent or somewhat tomentose, simple or branched, 2°–3½° high. Leaves oblong, oblong-lanceolate, or the lowest slightly spatulate, sessile, or somewhat clasping, not decurrent, acute or acutish, spinulose-margined, entire, lobed or pinnatifid into triangular-lanceolate lobes, the lower sometimes 8′ long and 2′ wide, narrowed into margined petioles, all pubescent or glabrate above, and densely white-tomentose beneath; heads long-peduncled, 1′–1½′ broad, about 1′ high; outer bracts of the involucre not coriaceous, lanceolate or ovate-lanceolate, tipped with weak short bristles, the inner ones very narrow and merely acuminate; flowers purple.

In dry woods and thickets, Virginia to Kentucky, Ohio, Florida and Texas. April-Sept.

5. Carduus Pítcheri (Torr.) Porter. Pitcher's Thistle. (Fig. 4062.)

Cnicus Pitcheri Torr.; Eaton, Man. Ed. 5, 180. 1829.
Cirsium Pitcheri T. & G. Fl. N. A. 2: 456. 1843.
Carduus Pitcheri Porter, Mem. Torr. Club, 5: 345. 1894.

Biennial, persistently white-tomentose throughout; stem stout, leafy up to the heads, usually branched, 1°–2° high. Leaves sessile, partly clasping, or slightly decurrent, pinnately divided into narrowly linear, entire lobed or pinnatifid, acute sparingly prickly segments 2″–3″ wide, with revolute margins; basal leaves often 12′ long; heads solitary or several and racemose-spicate at the ends of the branches, about 1½′ broad; outer bracts of the involucre ovate-lanceolate, sparingly pubescent and tomentose-ciliate, glutinous on the back, tipped with short spreading bristles, the inner narrowly lanceolate, acuminate or sometimes tipped with weak prickles; flowers cream color.

Shores of Lakes Michigan, Huron and Superior. June-Aug.

6. Carduus undulàtus Nutt. Wavy-leaved Thistle. (Fig. 4063.)

Carduus undulatus Nutt. Gen. 2: 130. 1818.
Cnicus undulatus A. Gray, Proc. Am. Acad. 10: 42. 1874.

Biennial, persistently and densely white-tomentose throughout, or the upper surfaces of the leaves at length green and glabrous; stem stout, leafy, usually branched, 1°–3° high. Leaves lanceolate or oblong-lanceolate in outline, acute, sessile or decurrent, or the lowest petioled, undulate, lobed or pinnatifid, the lobes dentate, triangular, often very prickly; basal leaves often 8′ long; heads about 2′ broad, and nearly as high, solitary at the ends of the branches; outer bracts of the involucre ovate or ovate-lanceolate, firm, glutinous on the back, tipped with short spreading prickles, the inner ones lanceolate, acuminate; flowers purple or pink.

On plains and prairies, Lake Huron to the Northwest Territory and British Columbia, south to Kansas, New Mexico and Oregon. June-Sept.

Carduus undulàtus megacéphalus (A. Gray) Porter, Mem. Torr. Club, 5: 345. 1894.
Cnicus undulatus var. *megacephalus* A. Gray, Proc. Am. Acad. 10: 42. 1874.
Heads larger than in the type, 2′–3′ broad. Minnesota to Idaho and Arizona.

7. Carduus Platténsis Rydberg. Prairie Thistle. (Fig. 4064.)

Carduus Plattensis Rydberg, Contr. Nat. Herb. 3: 167. *pl. 2.* 1895.

Perennial or biennial, the root thick and deep. Stem stout, simple, or little branched, 1½°–2½° tall, densely white-felted. Leaves deeply pinnatifid, white-tomentose beneath, green, loosely tomentose, or glabrate above, the lower 5′–7′ long, the lobes lanceolate to oblong, acute, prickly tipped and margined; upper leaves smaller and less divided; heads few, about 2′ high and broad; outer bracts of the involucre lanceolate to ovate-lanceolate, firm, dark, tipped with a short weak spreading prickle, the inner linear-lanceolate, unarmed, tipped with a scarious reflexed erose appendage; corolla yellow, its lobes linear; pappus of outer flowers merely barbellate.

Sand hills, Nebraska and South Dakota. May–July.

8. Carduus ochrocéntrus (A. Gray) Greene. Yellow-spined Thistle. (Fig. 4065.)

Cirsium ochrocentrum A. Gray, Mem. Am. Acad. 1: 110. 1849.

Cnicus ochrocentrus A. Gray, Proc. Am. Acad. 19: 57. 1883.

Carduus ochrocentrus Greene, Proc. Phil. Acad. 1892: 336. 1893.

Similar to *Carduus undulatus*, but commonly taller and more leafy, often 6° high, equally white-tomentose. Leaves oblong-lanceolate in outline, usually very deeply pinnatifid into triangular-lanceolate, serrate or entire segments, armed with numerous long yellow prickles; lower leaves often 6′–8′ long; heads about 2′ broad, 1½′–2′ high, solitary at the ends of the branches; outer bracts of the involucre lanceolate; tipped with stout yellow prickles of nearly or quite their own length, the inner narrowly lanceolate, long-acuminate; flowers purple (rarely white?).

On plains, Nebraska to Texas, Nevada and Arizona. May–Sept.

9. Carduus Nebraskénsis Britton. Nebraska Thistle. (Fig. 4066.)

Stem densely white-woolly, apparently over 1° high. Leaves linear-oblong to lanceolate, white-woolly beneath, green and sparingly loosely woolly above, irregularly slightly toothed or entire, the upper 3′–6′ long, ¼′–1′ wide, the margins prickly; heads solitary, or few, short-peduncled, about 1½′ high; outer bracts of the involucre lanceolate, prickle-tipped, the inner narrower with a reflexed acute scarious appendage; pappus-bristles of inner flowers plumose, of the outer barbellate.

Scott's Bluff, western Nebraska (P. A. Rydberg, No. 110. 1891).

10. Carduus odoràtus (Muhl.) Porter. Pasture Thistle. Fragrant Thistle. (Fig. 4067.)

Cnicus odoratus Muhl. Cat. 70. 1813.
Carduus pumilus Nutt. Gen. 2: 130. 1818.
Cnicus pumilus Torr. Compend. 282. 1826.
Carduus odoratus Porter, Mem. Torr. Club, 5: 345. 1894.

Biennial, more or less villous-pubescent; stem stout, simple or branched, leafy, 1°–3° high. Roots thick, branched, solid; stem-leaves green both sides, sessile and clasping, oblong or oblong-lanceolate in outline, acute, 3′–7′ long, 1′–2′ wide, pinnatifid into triangular acute dentate prickly lobes; basal leaves petioled; heads solitary, terminal, 2′–3′ broad, about 2′ high, often involucrate by the upper leaves; outer bracts lanceolate or ovate-lanceolate, with a slight glutinous strip on the back, glabrous or sparingly tomentose, tipped with slender prickles, the inner narrow, long-acuminate; flowers purple, rarely white, fragrant; tips of the pappus-bristles usually spatulate.

In fields, Maine to Pennsylvania and Delaware. July–Sept.

11. Carduus Híllii (Canby) Porter. Hill's Thistle. (Fig. 4068.)

Cnicus Hillii Canby, Gard. & For. 4: 101. 1891.
Carduus Hillii Porter, Mem. Torr. Club, 5: 344. 1894.

Biennial ? low, villous-pubescent or somewhat woolly; stem leafy, simple or branched, 1°–2° high. Root perpendicular, fusiform, slender and hollow above, enlarged below, 8′–12′ long; leaves green both sides, mostly obtuse, lobed or pinnatifid, the lobes mostly broad and rounded, dentate, spinulose or with some rather stout prickles, the upper oblong, sessile and clasping, the lower spatulate-oblong, narrowed at the base or the lowest ones petioled and 6′–8′ long; heads 2′–3′ broad, about 2′ high; outer bracts of the involucre ovate-lanceolate, tipped with short bristles, conspicuously glutinous on the back, the inner narrowly lanceolate, long-acuminate; flowers purple; pappus-bristles slender-pointed or some of them slightly spatulate.

In fields, western Ontario to Minnesota, south to Pennsylvania, Illinois and Iowa. June–July.

12. Carduus spinosíssimus Walt. Yellow Thistle. (Fig. 4069.)

Carduus spinosissimus Walt. Fl. Car. 194. 1788.
Cirsium horridulum Michx. Fl. Bor. Am. 2: 90. 1803.
Cnicus horridulus Pursh, Fl. Am. Sept. 507. 1814.

Biennial or perennial, somewhat woolly when young, but becoming glabrate; stem branched, leafy, 2°–5° high. Leaves green both sides, lanceolate or oblong in outline, sessile and clasping or the basal ones short-petioled and somewhat spatulate, pinnatifid into triangular or broader, spinulose-margined and prickle-tipped, entire or dentate lobes; heads involucrate by the upper leaves, 2′–4′ broad, 1½′–2½′ high; bracts of the involucre narrowly lanceolate, roughish and ciliate, long-acuminate, unarmed; flowers pale yellow, yellowish, or occasionally purple.

In moist or dry sandy soil, Maine to Pennsylvania, Florida and Texas. Abundant along the edges of salt-meadows in New York and New Jersey. May-Aug., or earlier in the South.

13. Carduus mùticus (Michx.) Pers. Swamp Thistle. (Fig. 4070.)

Cirsium muticum Michx. Fl. Bor. Am. 2: 89. 1803.
Carduus muticus Pers. Syn. 2: 386. 1807.
Cnicus muticus Pursh, Fl. Am. Sept. 506. 1814.

Biennial; stem woolly or villous when young, becoming glabrate, slender, striate, leafy, paniculately branched above, 3°–8° high. Leaves densely white-tomentose beneath when young, sometimes becoming glabrous on both sides, deeply pinnatifid into lanceolate or oblong, entire, lobed or dentate, spiny segments usually tipped with slender prickles; basal leaves petioled, 4′–8′ long, those of the stem sessile and smaller; heads about 1½′ broad and high, solitary, terminal, naked-peduncled, or with a few small bract-like leaves near the base; outer bracts viscid, appressed, more or less cottony, ovate or ovate-lanceolate, the inner linear-lanceolate, acute, all unarmed; flowers purple.

In swamps and moist soil, Newfoundland to Florida, Northwest Territory and Texas. July–Oct.

Carduus mùticus subpinnatífidus Britton.

Leaves lobed, not deeply pinnatifid, green, and nearly glabrous on both sides. New Jersey to West Virginia.

14. Carduus arvénsis (L.) Robs. Canada Thistle. Creeping Thistle. (Fig. 4071.)

Serratula arvensis L. Sp. Pl. 820. 1753.
Cirsium arvense Scop. Fl. Carn. Ed. 2, 2: 126. 1772.
Carduus arvensis Robs. Brit. Fl. 163. 1777.
Cnicus arvensis Hoffm. Deutsch. Fl. Ed. 2, 1: Part 2, 130. 1804.

Perennial by horizontal rootstocks, forming patches, nearly glabrous; stems striate, 1°–3° high, branched above. Leaves sessile and slightly clasping, lanceolate or oblong-lanceolate, deeply pinnatifid into very prickly, lobed or dentate segments; basal leaves sometimes petioled, 5′–8′ long; heads numerous, corymbose, dioecious, 1′ broad or less, nearly 1′ high, purple or white, staminate heads globose, corollas projecting; pistillate heads oblong-campanulate, corollas shorter, the long pappus conspicuous; outer bracts ovate or ovate-lanceolate, appressed, tipped with short prickly points, inner bracts of the pistillate heads linear, elongated.

In fields and waste places, Newfoundland to Virginia, Minnesota and Nebraska. In many places a pernicious weed. Naturalized from Europe. Called also Way or Cursed Thistle, Corn or Hard Thistle. June–Sept.

15. Carduus nùtans L. Musk Thistle. Plumeless Thistle. (Fig. 4072.)

Carduus nutans L. Sp. Pl. 821. 1753.

Biennial, branched, sparingly tomentose, 2°–3° high. Leaves lanceolate in outline, deeply pinnatifid, acuminate, 3′–6′ long, the lobes triangular, very prickly; heads long-peduncled, solitary at the end of the stem or branches, 1½′–2½′ broad, nodding, purple, rarely white, fragrant; bracts of the involucre in many series, lanceolate, long-acuminate, the prominent mid-nerve prolonged into a prickle, or the inner nerveless and awned; pappus-bristles 10″–1′ long, white, very minutely barbed.

In waste places, Pennsylvania and New Jersey to New Brunswick, and in ballast about the sea ports. Naturalized or adventive from Europe. Native also of Asia. Bank or Buck Thistle, Queen Ann's Thistle. July–Oct.

16. Carduus crispus L. Curled Thistle. Welted Thistle. (Fig. 4073.)

Carduus crispus L. Sp. Pl. 821. 1753.

Biennial, somewhat tomentose; stem much branched, densely prickly, 2°–4° high. Leaves lanceolate in outline, with undulate and ciliate-spiny margins, all sinuate-pinnatifid into broad, 3-lobed, toothed segments, the teeth prickle-pointed, heads several, usually crowded at the ends of the winged branches, 1′ broad or less, purple or white, sessile or short-peduncled, or some of them rarely solitary and slender-peduncled; bracts of the involucre very numerous, linear, the outer prickle-tipped and rigid, the inner thinner and merely acuminate.

In waste places, New Brunswick and Nova Scotia, and in ballast about the seaports. Adventive from Europe. Native also of Asia. July–Sept.

98. MARIÀNA Hill, Veg. Syst. 4: 19. 1762.

[Silybum Gaertn. Fruct. & Sem. 2: 398. *pl. 162.* 1802.]

Annual or biennial, simple or branched, nearly glabrous herbs, with large alternate clasping, sinuate-lobed or pinnatifid, white-blotched leaves, and large discoid heads of purple tubular flowers, solitary at the end of the stem or branches. Involucre broad, subglobose, its bracts rigid, imbricated in many series, the lower ones fimbriate-spinulose at the broad triangular summit, the middle ones similar but armed with huge spreading or recurved spines, the inner lanceolate, acuminate. Receptacle flat, densely bristly. Corolla-tube slender, the limb expanded and deeply 5-cleft. Filaments monadelphous below, glabrous. Anthers sagittate at the base. Style nearly entire. Achenes obovate-oblong, compressed, glabrous, surmounted by a papillose ring. Pappus-bristles in several series, flattish, barbellate or scabrous.

A monotypic genus of the Mediterranean region.

1. Mariana Mariàna (L.) Hill. Milk Thistle. (Fig. 4074.)

Carduus Marianus L. Sp. Pl. 823. 1753.
Mariana Mariana Hill, Hort. Kew. 61. 1769.
Silybum Marianum Gaertn. Fruct. & Sem. 2: 378. 1802.

Stem striate, glabrous or slightly woolly, little branched, 2°–4° high. Leaves oblong-lanceolate, prickly, strongly clasping, the lower often 12′ long and 6′ wide, the upper much smaller, scarcely lobed, acute; heads about 2½′ broad; spines of the middle involucral bracts often 1½′ long; pappus-bristles white, barbellate.

Escaped from gardens near Kingston, Ontario (T. Walker, according to Macoun), in ballast about the eastern seaports, and on the Pacific Coast from British Columbia to southern California, where it is naturalized. Called also Virgin Mary's Thistle, Lady's Milk, Holy Thistle. June–Aug.

99. ONOPÓRDON L. Sp. Pl. 827. 1753.

Coarse, branching or rarely acaulescent, tomentose herbs, with stout stems winged by the decurrent bases of the alternate dentate or pinnatifid, prickly leaves, and large discoid heads of purple violet or white flowers, mostly solitary at the ends of the branches. Involucre nearly globular, its bracts imbricated in many series, all tipped with long spines in our species, the inner narrower than the outer. Receptacle flat, fleshy, honeycombed, not bristly. Corolla-tube slender, the limb expanded and deeply 5-cleft. Filaments pilose. Anthers sagittate at the base. Achenes obovate or oblong, 4-angled or compressed, smooth or corrugated. Pappus-bristles in several series, filiform, barbellate or plumose, united at the base. [Greek, Asses' thistle, the ancient name.]

About 12 species, natives of the Old World.

1. Onopordon Acánthium L. Cotton Thistle. Scotch Thistle. (Fig. 4075.)

Onopordon Acanthium L. Sp. Pl. 827. 1753.

Biennial, white-tomentose all over; stem usually much branched, leafy, 3°–9° high. Leaves oblong, lobed and dentate, acute, very spiny, the lower often 12′ long; heads 1½′–2′ broad, about 1½′ high, solitary at the ends of the branches; outer bracts of the involucre ovate or oblong, minutely serrulate, tipped with long stout spreading spines; flowers pale purple; achenes slightly corrugated; pappus-bristles brownish, longer than the achene.

In waste places, Nova Scotia and Ontario to New Jersey and Michigan. Naturalized from Europe. Native also of Asia. Called also Argentine, Asses', Oat or Down Thistle, Queen Mary's or Silver Thistle. July–Sept.

100. CENTAURÈA L. Sp. Pl. 909. 1753.

Perennial or annual herbs, with alternate entire dentate incised or pinnatifid leaves, and large or middle-sized heads, of tubular purple violet white or rarely yellow flowers. Involucre ovoid or globose, its bracts imbricted in many series, appressed, fimbrillate, or dentate. Receptacle flat, densely bristly. Marginal flowers usually neutral and larger than the central ones, which are perfect and fertile, or flowers all perfect and fertile in some species. Corolla-tube slender, the limb regular or oblique, 5-cleft or 5-lobed, the segments sometimes appearing like rays. Anthers sagittate at the base. Style-branches short, somewhat connate, obtuse. Achenes oblong or obovoid, compressed or obtusely 4-angled, usually smooth and shining, obliquely or laterally attached to the receptacle, surmounted by a disk with an elevated margin. Pappus of several series of bristles or scales, rarely none. [Greek, of the Centaurs, who were said to use it in healing.]

About 350 species, mostly natives of the Old World. Besides the following, 2 others, introduced species, occur on the Pacific Coast, and are rarely found in ballast about the eastern seaports. Bracts of the involucre lacerate or fimbriate, not spiny.

Heads 1½′ broad or less; achenes laterally attached; introduced species.	
Annual; pappus about the length of the achene.	1. *C. Cyanus.*
Perennials; pappus obsolete, or short.	
Flowers all perfect; marginal ones scarcely enlarged.	2. *C. nigra.*
Marginal flowers neutral, with palmately cleft corollas.	3. *C. Jacea.*
Heads 2′–4′ broad; achenes obliquely attached; native western species.	4. *C. Americana.*
Bracts of the involucre tipped with stout, nearly simple spines.	5. *C. Calcitrapa.*

1. Centaurea Cyanus L. Blue-bottle. Corn Blue-bottle. Corn-flower. (Fig. 4076.)

Centaurea Cyanus L. Sp. Pl. 911. 1753.

Annual, woolly or tomentose, at least when young; stem leafy, slender, branched, 1°–2½° high, the branches ascending. Leaves linear or linear-lanceolate, mucronate, 3′–6′ long, the basal and lower ones mostly dentate or pinnatifid, the upper, or sometimes all of them, entire; heads 1′–1½′ broad, on long naked peduncles; involucre campanulate, its bracts greenish-yellow or with darker tips and margins, appressed, fimbriate with scarious teeth; flowers blue or purplish, varying to white, the marginal ones neutral with large radiant corolla-limbs; achenes slightly compressed, or 4-angled; pappus-bristles unequal, nearly as long as the achene.

In waste places, escaped from gardens, and in ballast, Quebec to western New York and Virginia. Other names are Witches'-bells or Thimbles, Corn-Centaury, Corn-bottle or -binks, Brushes, Hurtsickle, Blue Bonnets, Blaver, Blue Poppy. July–Sept.

2. Centaurea nigra L. Black Knapweed. Horse-knops. Hardheads. Centaury. (Fig. 4077.)

Centaurea nigra L. Sp. Pl. 911. 1753.

Perennial, scabrous or pubescent; stem stiff, branched, 1°–2° high. Lower and basal leaves spatulate or oblong, acutish, entire, denticulate, dentate or lobed, not pinnatifid, 3′–6′ long, narrowed into long petioles; upper leaves oblong or lanceolate, sessile, or partly clasping, entire or nearly so; heads rarely 1′ broad, bracted by the small, uppermost leaves; involucre globose, its bracts lanceolate or ovate lanceolate, closely imbricated, tipped with brown fimbriate appendages, or the uppermost merely lacerate; flowers rose-purple, all perfect, the marginal ones usually not at all enlarged; achenes slightly 4-sided; pappus none, or a ring of minute scales.

In waste places and fields, Newfoundland to Ontario and New Jersey. Naturalized from Europe. Among many other English names are Iron-head or -weed, Club-weed, Matfelon, Hurt-sickle, Tassel, Horse-knobs, Crop-, Knob-, Bole-, or Button-weed, Loggerheads, Lady's Cushion, Blue-tops. July–Sept.

3. Centaurea Jàcea L. Brown or Rayed Knapweed. (Fig. 4078.)

Centaurea Jacea L. Sp. Pl. 914. 1753.

Perennial, similar to the preceding species. Leaves entire or denticulate, rarely lobed; heads 1′–1½′ broad; involucre globular to ovoid, its bracts closely imbricated, brown or with brown backs, the outer ones with fimbriate appendages, the middle ones lacerate, the inner entire or nearly so; marginal flowers neutral with enlarged radiant corolla-limbs; achenes obscurely 4-sided; pappus none, or a minute crown.

In waste places northern New York and Vermont, and in ballast about eastern seaports. Also in British Columbia. Fugitive from Europe. June-Sept.

4. Centaurea Americàna Nutt. American Star Thistle. (Fig. 4079.)

C. Americana Nutt. Journ. Phila. Acad. 2:117. 1821. *Plectocephalus Americanus* Don, in Sweet, Brit. Fl. Gard. (II). *pl. 51.* 1831.

Annual, roughish; stem stout, simple, or little branched, 2°–6° high. Leaves entire or denticulate, the lower and basal ones spatulate or oblong, 2′–5′ long, narrowed into petioles, the upper oblong-lanceolate, sessile, mucronate; heads solitary at the ends of the leafy stem or branches, very showy, 2′–4′ broad; involucre nearly hemispheric, its bracts ovate or lanceolate with conspicuously pectinate appendages; flowers pink or purple, the marginal ones with enlarged and radiant corolla-limbs; achenes somewhat compressed, obliquely attached at the base; pappus of copious unequal bristles longer than the achene.

Dry plains, Missouri and Arkansas to Louisiana, Mexico and Arizona. May-Aug.

5. Centaurea Calcítrapa L. Star Thistle (Fig. 4080.)

Centaurea Calcitrapa L. Sp. Pl. 917. 1753.

Annual, pubescent or glabrous, green; stem much branched, 1°–1½° high. Leaves 1–2-pinnatifid into oblong-lanceolate to linear, serrulate-spinulose, deutate or entire mostly acute lobes, the upper sessile and slightly clasping, the lower and basal short-petioled, 4′–7′ long, the uppermost somewhat involucrate at the bases of the sessile heads which are about 1′ broad; involucre ovoid, its outer bracts ovate-oblong, tipped with stout spreading spines which are simple, or commonly with 2–6 bristles at the base; flowers purple, none of them radiant; achenes compressed or obscurely 4-sided; pappus none.

In waste places and ballast, southern New York and New Jersey to Virginia. Also in British Columbia. Adventive or naturalized from Europe. Called also Caltrops, Maize Thorn. June–Oct.

101. CNÌCUS L. Sp. Pl. 826. 1753.

An annual herb, with alternate pinnatifid or sinuate-dentate leaves, the lobes or teeth spiny, and large sessile heads of yellow tubular flowers, solitary at the ends of the branches, subtended by the upper leaves. Bracts of the involucre imbricated in several series, the outer ovate, the inner lanceolate, tipped by long pinnately branched spines. Receptacle flat, bristly. Achenes terete, striate, laterally attached, the horny margin 10-toothed at the summit; pappus of 2 series of awns, the inner fimbriate, the outer longer, naked; anther-appendages elongated, united to their tips. [Latin name of Safflower, early applied to thistles.]

A monotypic genus of the Old World.

1. Cnicus benedictus L. Blessed Thistle. Our Lady's Thistle. (Fig. 4081.)

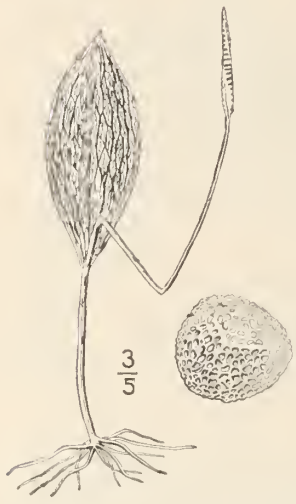
Cnicus benedictus L. Sp. Pl. 826. 1753.
Centaurea benedicta L. Sp. Pl. Ed. 2, 1296. 1763.

Hirsute or pubescent, much branched, seldom over 2½° high. Leaves oblong-lanceolate in outline, rather thin, reticulate-veined, 3′–6′ long, the upper clasping, the basal and lower ones narrowed at the base and petioled; heads about 2′ broad, subtended by several large lanceolate to ovate-lanceolate leaves; bristles of the receptacle soft, long; outer awns of the pappus alternating with the inner.

In waste places, Nova Scotia to Maryland, Pennsylvania and Alabama, and on the Pacific Coast. Adventive from southern Europe. Called also St. Benedict's Thistle. May–Aug.

Appendix.

The following are new discoveries or new determinations, mostly from the west, made while the work has been in press.



[Vol. 1: p. 2.] **2. Ophioglossum Engelmánni** Prantl. Engelmann's Adder's-tongue. (Fig. 1a.)

Ophioglossum vulgatum Eaton, Ferns of the Southwest, U. S. Geol. Surv. 340. 1878. Not L. 1753.
Ophioglossum Engelmanni Prantl. Jahrb. d. k. Bot. Gart. Berlin, 3: 318. *pl. 8, fig. 17.* 1884.

Rootstock cylindric; stems often several, 1–5 from the same root, 3′–9′ high, bearing the sessile fleshy elliptic leaf below the middle; blade 1′–3½′ long, ½′–2′ wide, *with wide oblique meshes containing numerous anastomosing veinulets, the apex mucronulate;* spike 6″–12″ long, apiculate, borne on a stalk 1′–4′ long, sporangia 12–27 pairs.

In damp, sterile places or on rocks in cedar woods, in the Central States, from Indiana to Texas and Arizona, also in Virginia. April–Oct.

[Vol. 1: p. 2.] **3. Ophioglossum arenàrium** E. G. Britton. Sand Adder's-tongue. (Fig. 1b.)

Ophioglossum arenarium E. G. Britton, Bull. Torr. Club, 24: 555. *pl. 318.* 1897.

Rootstock slightly thickened, with 1 or 2 stalks; stem rigid, erect, 2′–7′ high, bearing the sessile *lanceolate fleshy leaf below the middle;* blade 1′–2′ long, 3″–6″ wide, acute or apiculate, not pellucid, *with indistinct venation forming long narrow meshes*, with few, if any, free veinlets; spike 6″–13″ long, apiculate, borne on a stalk 2′–4′ long, often twisted; sporangia 12–26 pairs.

Gregarious in a colony of many plants in sandy ground under trees at Holly Beach, New Jersey. The genus is also called Adder's-fern, Adder's-spear and Snake-tongue. July.

[Vol. 1: p. 3.] **4a. Botrychium dissèctum** Spreng. Cut-leaved Grape-fern, or Moonwort. (Fig. 5a.)

Botrychium dissectum Spreng. Anleit, 3: 172. 1804.
Botrychium ternatum var. *dissectum* D. C. Eaton, Ferns N. A. 1: 150. 1878.

Plant 8′–16′ high with slender fleshy stems. Sterile portion long-stalked from near the base of the stem with broadly deltoid basal divisions, *decompound;* secondary pinnae lanceolate from a broader base, *pinnate with laciniate and deeply cut pinnules*, the ultimate divisions divergent, often two toothed at their apices, usually less than half a line wide; fertile portion with a long stem, bi-tripinnate; bud pilose, enclosed in the base of the stem, the apex of both portions bent downward in vernation.

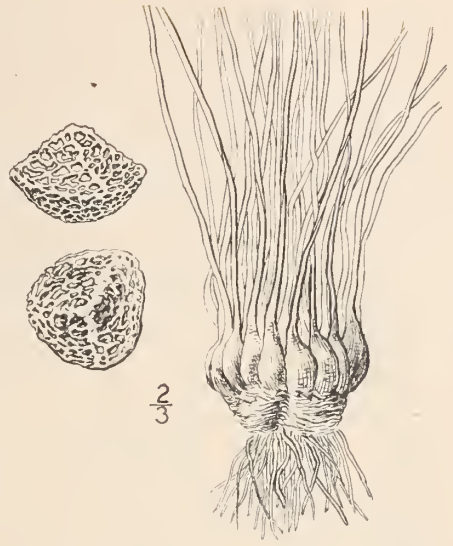
In low grounds, rare in New England as far as eastern Massachusetts, more common southward from New York to Virginia and inland to Indiana and Kentucky.

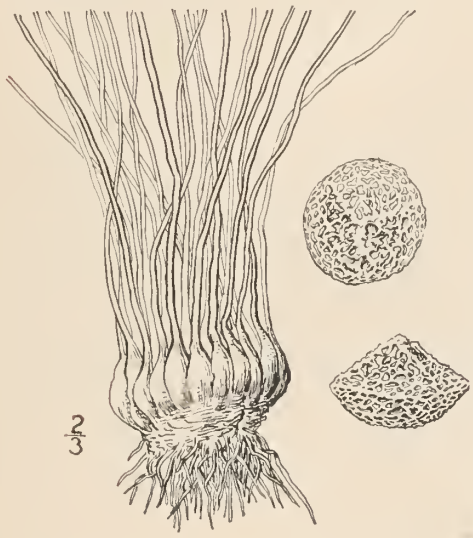
[Vol. 1: p. 47.] 5a. Isoetes Dódgei A. A. Eaton. Dodge's Quillwort. (Fig. 106a.)

Isoetes Dodgei A. A. Eaton, Fern Bull. 6:6. 1898.

Plant amphibious from a bilobed trunk. Leaves 10–75, 8′–18′ long when submersed, erect, or spirally ascending when scattered; emersed leaves 4′–6′ long, tortuous and often interlaced, with numerous stomata and usually 4 bast bundles: velum narrow, covering ⅕ to ¼ of the sporange; sporanges thickly sprinkled with light brown cells; macrospores more numerous on submersed plants, globose, 500–675μ in diameter, *sparsely covered with irregular crests* which at maturity separate into irregular groups leaving bare spaces, serrate or spinulose at the top; microspores more numerous on emersed plants, 22–40μ, ashy, papillose.

Growing in mud flats, East Kingston, New Hampshire.





[Vol. 1: p. 47.] 5b. Isoetes Èatoni Dodge. Eaton's Quillwort. (Fig. 106b.)

Isoetes Eatoni Dodge, Ferns and Fern Allies of New Eng. 39. 1896.

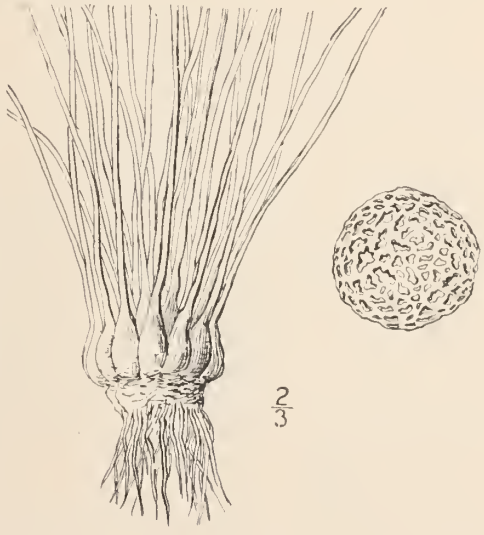
Amphibious from a large trunk 1′–2′ to 1′–4′ in diameter. Leaves of the submerged plant 20–200, varying in length up to 28′, marked with an elevated ridge on the ventral side; leaves of the emersed plant shorter, 3–6; stomata abundant; peripheral bast bundles irregular in occurrence or often wanting; velum covering 1–4 of the sporange, polygamous; sporanges large, 0.4′ by 0.15′, pale spotted; macrospores small, 300–400μ in diameter, *marked with convolute labyrinthine ridges and cristate on the angles of the inner face;* microspores 25–30μ in diameter, smooth or slightly papillose.

In mud flats, East Kingston and Epping, New Hampshire.

[Vol. 1: p. 47.] 5c. Isoetes foveolàta A. A. Eaton. Pitted Quillwort. (Fig. 106c.)

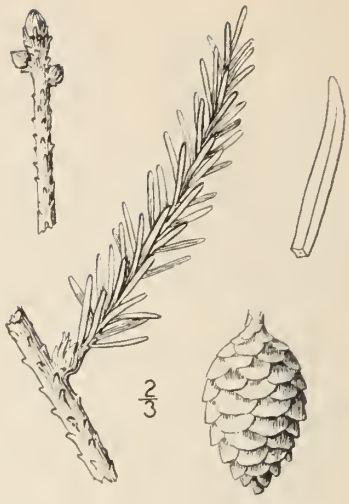
Isoetes foveolata A. A. Eaton; Dodge, Ferns and Fern Allies of New Eng. 38. 1896.

Amphibious from a bilobed or rarely trilobed base. Leaves 15–70, stout, 2′–6′ long, pinkish even when dry, or rarely dark green; stomata scattered, found only near the tips; no peripheral bast bundles; monoicous or becoming dioicous; velum covering 1–4 or 1–3 of the sporange; ligule round-ovate; sporanges thickly sprinkled with dark cells which are often collected in groups; macrospores 380–560μ, *covered beneath with very thick-walled reticulations, the openings appearing like little pits;* reticulations elongate on the upper surface of the spore; microspores dark brown, 22–35μ long, densely reticulate and usually slightly papillose.



In muddy banks of the Pautuckaway river, Epping, N. H., also at East Kington of the same state.

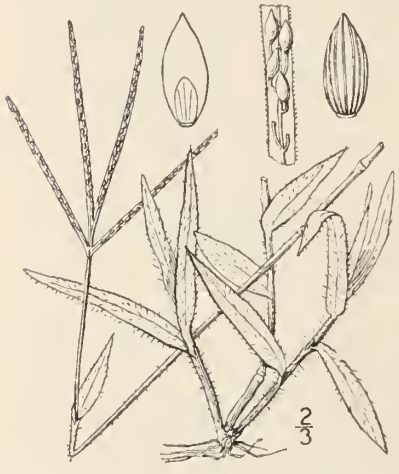
[Vol. 1: p. 55.] **4. Picea brevifòlia** Peck. Swamp Spruce. (Fig. 122a.)



Picea brevifolia Peck, Spruces of the Adirondacks, 13. 1897.

A small slender tree, sometimes 30° high, or on mountain summits reduced to a low shrub. *Twigs pubescent;* sterigmata glabrous, or slightly pubescent; leaves straight, or a little curved, *mostly glaucous, obtuse, or merely mucronulate, stout, 2″–5″ long;* cones oval, *persistent for two seasons or more,* 8″–12″ long, the scales with eroded margins; wing of the seed about 2″ long.

In swamps and open bogs, Vermont and northern New York to Michigan. June.



[Vol. 1: p. 111.] **2a. Syntherisma serótina** Walt. Late-flowering Finger-grass. (Fig. 241a.)

Syntherisma serotina Walt. Fl. Car. 76. 1788.
Panicum serotinum Trin. Gram. Panic. 166. 1826.

Culms slender, erect, often creeping and branching at the base, 8′–24′ tall, smooth and glabrous. Sheaths about one-half as long as the internodes, pilose with long spreading hairs; ligule a scarious ring; leaves linear-lanceolate to lanceolate, 1′–4′ long, 2″–4″ wide, acuminate, pilose on both surfaces; inflorescence composed of 2–6 1-sided slender erect or ascending spike-like racemes 1′–4½′ long, arranged singly, in pairs, or scattered and approximate; spikelets numerous, oval, *about ¾″ long* and one-half as broad, acute, in pairs, one short-, the other long-pedicelled, in 2 rows on one side of a flat and winged rachis less than ½″ wide; first scale wanting, *the second about one-half as long as the spikelet,* 3-nerved, the third scale 7-nerved, both scales appressed-pubescent on the margins.

Fields and roadsides, Delaware (according to Scribner); North Carolina to Florida, west to Mississippi.

[Vol. 1: p. 113.] **1a. Panicum colònum** L. Jungle Rice. (Fig. 243a.)

Panicum colonum L. Syst. Ed. 10, 870. 1759.
Panicum Walteri Ell. Bot. S. C. & Ga. 1: 115. 1817. Not Pursh, 1814.

Culms tufted, smooth and glabrous, 6′–2½° tall, often decumbent and rooting at the lower nodes. Sheaths compressed, usually crowded; ligule wanting; leaves flat, 1′–7′ long, 1″–4″ wide; inflorescence composed of 3–18 1-sided more or less spreading dense racemes, ¼′–1¼′ long, disposed along a 3-angled rachis and generally somewhat exceeding the length of the internodes; spikelets single, in pairs, or in 3's in 2 rows on one side of the hispidulous triangular rachis, obovate, pointed, the first scale about one-half as long as the spikelet, 3-nerved, *the second and third scales a little more than 1″ long, awnless,* 5-nerved, hispid on the nerves, the fourth scale cuspidate.

Fields and roadsides, Virginia to Florida, Texas and Mexico. Common in all tropical countries. March–Sept.

[Vol. 1: p. 118.] **17a. Panicum Liebérgii** (Vasey) Scribn. Lieberg's Panicum. (Fig. 259a.)

Panicum scoparium Lam. var. *Liebergii* Vasey, Bull. U. S. Dept. Agric. Div. Bot. 8: 32. 1889.
Panicum Liebergii Scribn.; Vasey, Bull. U. S. Dept. Agric. Div. Bot. 8: 32. As synonym. 1889.

Culms erect, slender, glabrous, roughish, especially near the nodes, 1°–2° tall, at length branched. Sheaths papillose-hirsute with spreading hairs, usually longer than the internodes; ligule a short scarious ciliolate ring; leaves erect or ascending, lanceolate, 2′–4′ long, 3″–6″ wide, acuminate at the apex, rounded at the partly clasping base, papillose-hispid beneath and sometimes sparingly so on the rough upper surface; *panicle oblong*, 2′–4′ long, *its branches erect or ascending;* spikelets 1½″–2″ long, oval, *the outer three scales papillose-hirsute with long spreading hairs*, the first scale about one-half as long as the spikelet, ovate, acute, 1–3-nerved, the second and third scales broadly oval when spread out, 7–9-nerved.

Dry soil, Ohio to Minnesota and South Dakota, south to Missouri and Nebraska. June–July.

[Vol. 1: p. 120.] **21a. Panicum Brittoni** Nash. Britton's Panicum. (Fig. 263a.)

Panicum Brittoni Nash, Bull. Torr. Club, 24: 194. 1897.

Smooth and glabrous. Culms coarsely striate, *not branched*, tufted, *slender*, erect, rigid, 4′–8′ tall; sheaths less than one-half as long as the internodes; ligule a ring of short hairs; leaves longer than the sheaths, those on the culm three in number, the middle one the longest, ½′–1¼′ long, ¾″–1½″ wide, erect, acuminate, 5–7-nerved; panicle ¾′–1¼′ long, its branches spreading or ascending; spikelets one-half as long as the pedicels, or less, obovoid, obtuse, ¾″ *long*, the first scale one-third as long as the spikelet, the second and third scales 7-nerved, densely pubescent with spreading hairs.

Moist sand in the pine barrens of southern New Jersey. May–June.

[Vol. 1: p. 120.] **22a. Panicum Nashiànum** Scribn. Nash's Panicum. (Fig. 264a.)

Panicum Nashianum Scribn. Bull. U. S. Dept. Agric. Div. Agrost. 7: 79. 1897.

Culms tufted, glabrous or puberulent, slender, 6′–15′ tall, at length much branched. Sheaths glabrous, or the lower pubescent, the primary about one-third as long as the internodes, those on the branches overlapping; ligule a short scarious ring; leaves erect or ascending, lanceolate, acuminate, smooth and glabrous, ciliate, at least at the base, ¾′–2′ long, 1″–2½″ wide, the leaves of the branches smaller; primary panicle 1′–2′ long, the branches widely spreading; spikelets about 1″ long, *obovate*, the first scale 1-nerved, the second and third scales 7-nerved, *densely pubescent with short spreading hairs.*

Pine lands, Virginia to Florida. March–July.

[Vol. 1: p. 120.] **22b. Panicum sphagnícolum** Nash. Sphagnum Panicum. (Fig. 264b.)

Panicum sphagnicolum Nash, Bull. Torr. Club, 22: 422. 1895.

Culms slender, smooth and glabrous, 1½°–3° long, *at length much elongated*, dichotomously much branched and *declining*. Sheaths smooth and glabrous, or the lower ones pubescent, one half the length of the internodes or less; ligule a short ring; leaves erect, smooth and glabrous on both surfaces, lanceolate, principal nerves 5–7, the primary leaves 1′–2½′ long, 1″–5″ wide, those on the branches 1½′ or less long, concealing the small contracted panicles; primary panicle loose and open, 1½′–3′ long, its branches spreading or ascending, the lower ¾′–1½′ long; spikelets on elongated filiform pedicels, scattered, ⅞″–1¼″ *long*, oval to obovate, the scales glabrous or sparsely pubescent, the first less than one-half as long as the spikelet, 1-nerved, the second and third scales 7-nerved.

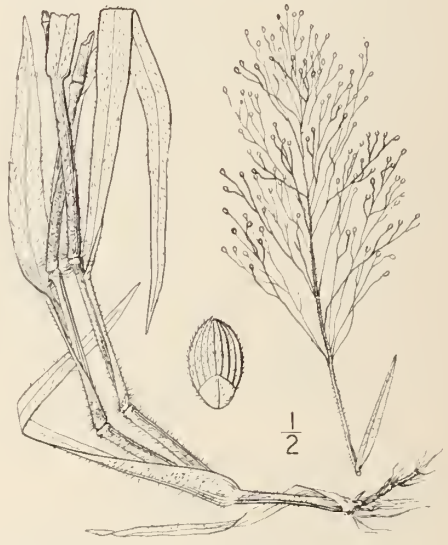
Sphagnum bogs, District of Columbia and southern New Jersey to Florida, west to Texas. June–Sept.

[Vol. 1: p. 121.] **24a. Panicum lanuginòsum** Ell. Woolly Panicum. (Fig. 266a.)

P. lanuginosum Ell. Bot. S. C. & Ga. 1: 123. 1817.

Culms, sheaths and leaves villous with spreading hairs, those on the leaves and the upper part of the culm shorter. Culms leafy, tufted, 1°–2½° tall, erect, at length branched, a smooth ring below each barbed node; sheaths shorter than the internodes; ligule a ring of long hairs; leaves erect, lanceolate, acuminate, 1½′–5′ long, 2″–4½″ broad; panicle ovate, 1½′–4′ long, the axis pubescent, the branches ascending, the larger 1′–2′ long; spikelets numerous, broadly obovate, *about ⅞″ long*, the first scale orbicular, glabrous or pubescent, 1-nerved, the second and third scales nearly orbicular when spread out, 7–9-nerved, densely pubescent with spreading hairs.

Dry sandy soil, southern New Jersey to Florida and Alabama.



[Vol. 1: p. 121.] **25a. Panicum implicàtum** Scribn. Hairy-panicled Panicum. (Fig. 267a.)

Culms tufted, erect, 10′–18′ tall, *very slender*, more or less pubescent, at length much branched. Sheaths shorter than the internodes, *densely papillose-hirsute*, at least the lower ones; ligule a ring of long hairs; leaves erect, lanceolate; ½′–2′ long, 1″–3″ wide, *at least the lower ones papillose-hirsute on both surfaces*, especially beneath; panicle open, ovate, 1′–2¼′ long, *its branches widely spreading;* spikelets broadly obovate, obtuse, purplish, about ¾″ long, the outer 3 scales pubescent with short spreading hairs, the first scale nearly one-half as long as the spikelet, *broadly ovate*, obtuse, 1-nerved, the second and third scales orbicular-oval, 7-nerved.

Dry soil, Maine to New York. Related to *P. pubescens* Lam., but certainly distinct.

[Vol. 1: p. 121.] **25b. Panicum Columbiànum** Scribn. American Panic-grass. Short-leaved Panicum. (Fig. 267b.)

Panicum Columbianum Scribn. Bull. U. S. Dept. Agric. Div. Agrost. 7: 78. 1897.

Culms tufted, erect, *softly pubescent*, 8′–2° tall, at length dichotomously branched, *the branches erect.* Lower sheaths pubescent, the upper glabrous, the primary one-half as long as the internodes; ligule a ring of short hairs; leaves lanceolate, erect, *thickish and firm*, glabrous above, the lower ones more or less pubescent beneath, the primary 1½′–2½′ long, 2″–3″ wide, those on the branches smaller; panicle *small*, ovate, 1′–1½′ long, its branches ascending; spikelets broadly obovate, *a little more than ¾″ long*, the outer 3 scales densely pubescent with spreading hairs, the first scale about one-half as long as the spikelet, 1-nerved, the second and third scales 7-nerved.

Fields and open woods, Massachusetts to North Carolina, west to Tennessee and Alabama. June–Sept.

[Vol. 1: p. 121.] **25c. Panicum Èatoni** Nash. Eaton's Panicum. (Fig. 267c.)

Panicum Eatoni Nash, Bull. Torr. Club, 25: 84. 1898

Smooth and glabrous. Culms 1½°–3½° tall, erect, at length dichotomously branched and swollen at the nodes; sheaths much shorter than the internodes, usually more or less ciliate on the margins; ligule a ring of long hairs; leaves erect, lanceolate, acuminate, 1½′–4′ long, 1½″–5″ wide; panicle finally long-exserted, *dense and contracted*, 3′–5′ long, 1¼′ or less broad, *its branches erect-ascending;* spikelets oval, about ¾″ long, acutish, the first scale about one-third as long as the spikelet, pubescent, 1-nerved, the second and third scales broadly oval when spread out, 7-nerved, densely pubescent with spreading hairs.

Along the coast, in damp or wet places, Maine to New York. May–Aug.

[Vol. 1: p. 121.] **25d. Panicum tsugetòrum** Nash. Hemlock Panicum. (Fig. 267d.)

P. tsugetorum Nash, Bull. Torr. Club, 25: 86. 1898.

Culms and sheaths pubescent with short appressed or ascending hairs intermixed toward the base with longer ones. Culms tufted, 1½° or less tall, somewhat slender, at length much branched and *decumbent or prostrate;* sheath shorter than the internodes; ligule a ring of hairs about ½″ long; leaves erect or ascending, firm, lanceolate, 5–7-nerved, minutely appressed-pubescent beneath, smooth and glabrous above, or the upper primary leaves sometimes with a few long erect hairs, the primary leaves 1½′–3′ long, 2½″–4″ wide, those on the branches smaller and partly concealing the small panicles; primary panicles broadly ovate, 1½′–2½′ long, the branches spreading-ascending; spikelets broadly obovate, *about ⅞″ long*, the outer 3 scales pubescent, with short spreading hairs, the first scale 1–3-nerved, the second and third scales 7–9-nerved.

Dry soil in hemlock woods, Connecticut and New York.

[Vol. 1: p. 121.] **25e. Panicum Addisònii** Nash. Rigid Panicum. (Fig. 267e.)

P. Addisonii Nash, Bull. Torr. Club, 25: 83. 1898.

Culms 10′–15′ tall, *rigid*, tufted, erect or decumbent at the base, at length much branched, *the branches erect, pubescent below with long nearly appressed hairs* which decrease in length toward the summit where they are very short. Sheaths often longer than the internodes, appressed-pubescent, at least the lower ones; ligule a ring of hairs; leaves erect, lanceolate, thickish, smooth and glabrous on both surfaces, rough on the margins, acuminate, 1′–3′ long, 1½″–3″ wide; panicle ovate to oblong, ¾′–2¼′ long, its branches spreading or ascending; spikelets obovate, 1″ *long*, the first scale acute or acutish, about one-half as long as the spikelet, 1-nerved, pubescent, second and third scales 9-11-nerved, densely pubescent with long spreading hairs.

Sandy soil, southern New Jersey. May-June.

[Vol. 1: p. 121.] **25f. Panicum Atlánticum** Nash. Atlantic Panicum. (Fig. 267f.)

P. Atlanticum Nash, Bull. Torr. Club, 24: 346. 1897.

Papillose-pilose with long while spreading hairs. Culms tufted, at length branched, 12′–20′ tall, erect or ascending, a smooth ring below the nodes which are barbed with spreading hairs; sheaths shorter than the internodes; ligule a ring of hairs 1″–2½″ long; leaves erect, rigid, thickish, linear-lanceolate, 1¼′–4′ long, 2″–3½″ wide, acuminate, 7–11-nerved, middle leaves the longest; panicle 1½′–2½′ long, 1¼′–2¾′ wide, the branches and their divisions hispidulous; spikelets numerous, obovate, *a little over 1″ long, ¾″ wide*, obtuse, the outer 3 scales densely pubescent with short spreading hairs, the first scale about one-half as long as the spikelet, 1-nerved, the second and third scales 9-nerved.

Dry soil, New York to Virginia. June-Aug.

[Vol. 1: p. 121.] **26a. Panicum linearifòlium** Scribn. Linear-leaved Panicum. (Fig. 268a.)

Culms tufted, slender, erect, smooth and glabrous, simple, 6′–16′ tall. Sheaths glabrous or pilose with long white hairs, longer than the internodes; ligule a ring of short hairs; leaves elongated, smooth or rough, glabrous or more or less pilose, especially upon the lower surface, 3′–10′ long, 1″–2″ wide, the uppermost leaf the longest and often extending beyond the panicle; primary panicle loose and open, often long-exserted, 1½′–4′ long, its branches ascending, *secondary panicles small and contracted on very short culms and partly concealed by the bases of the long culms; spikelets 1″–1¼″ long, obtuse or acutish, pubescent with spreading hairs.*

Dry soil, especially hillsides, New York and New Jersey to Missouri.

[Vol. 1: p. 121.] 26b. Panicum Wérneri Scribn. Werner's Panicum. (Fig. 268b.)

Smooth and glabrous, light green. Culms tufted, erect, slender, simple or later sparingly branched, 10′–18′ tall; sheaths equalling or shorter than the internodes; ligule a ring of short hairs; leaves erect, elongated, *linear*, acuminate, 2½′–4¼′ long, 1½″–2½″ *wide*, panicle finally long-exserted, loose and open, 2½′–3½′ long, its branches ascending; *spikelets about* 1″ *long* on longer hispidulous pedicels, oval, *minutely and sparsely pubescent*, the first scale orbicular, about one-quarter as long as the spikelet, 1-nerved, the second and third scales 7-nerved, the fourth scale oval, slightly apiculate.

Dry knolls in swamps, New York and Ohio. The smaller spikelets *and the entire absence of the small basal panicles* serve to distinguish this from *P. linearifolium*, to which it otherwise has a great resemblance. June–July.

[Vol. 1: p. 121.] 26c. Panicum Bicknéllii Nash. Bicknell's Panicum. (Fig. 268c.)

P. Bicknellii Nash, Bull. Torr. Club, 24: 193. 1897.

Culms erect or decumbent at the base, slender, 8′–16′ tall, *at length sparingly branched*, the lower internodes puberulent, the nodes sparingly barbed. Sheaths generally longer than the internodes, ciliate on the margins, the lowermost pubescent; ligule a fringe of very short hairs; leaves elongated, increasing in length toward the top of the culm, erect, *linear-lanceolate*, acuminate, narrowed toward the ciliate base, 7–9-nerved, primary leaves 3′–7′ long, 2½″–5″ *wide*; primary panicle 2½′–3′ long, its branches ascending, secondary panicles smaller, with appressed branches; spikelets obovate or oval 1¼″–1½″ long, pubescent with short spreading hairs, the first scale 1-nerved, the second and third scales 9-nerved.

Dry wooded hills, New York and Pennsylvania. July-Aug.

[Vol. 1: p. 122.] 27a. Panicum neuránthum Griseb. Nerved Panicum. (Fig. 269a.)

Panicum neuranthum Griseb. Cat. Pl. Cub. 232. 1866.

Culms tufted, slender, at length much branched, the primary simple, erect, glabrous or pubescent, 12′–30′ tall. Sheaths glabrous, or the lower pubescent, the primary about one-half as long as the internodes, those on the branches overlapping; ligule a ring of hairs; leaves smooth and glabrous, the primary erect, acuminate, 1′–4′ long, 1″–2½″ wide, those on the branches shorter, erect or ascending, usually involute when dry, concealing the small secondary panicles; primary panicle 1′–4′ long, *its branches at first erect*, at length widely spreading; spikelets numerous, *broadly obovate*, *about* 1″ *long*, densely pubescent with short spreading hairs, the second and third scales 7-nerved.

Dry or moist soil along the coast, Virginia to Florida and Louisiana. Also in Cuba. June–Oct.

[Vol. 1: p. 132.] **1a. Savastana Náshii** Bicknell. Nodding Vanilla-grass. (Fig. 294a.)

S. Nashii Bicknell, Bull. Torr. Club, 25: 104. *pl. 328.* 1898.

Plant smooth, glabrous and shining. Culms erect, slender, simple, 2°–3° *tall*. Sheaths overlapping, striate; ligule scarious, 2″–3″ long; leaves erect or ascending, *elongated*, a little roughened above, the culm leaves 5 or 6, 2′–8′ *long*, 2″–3″ wide, acuminate; panicle long-exserted, *loose and open*, 7′–17′ *long*, its apex nodding, *the capillary branches drooping*, *the larger* 3′–7′ *long*, in pairs, the divisions more or less flexuous; spikelets 2½″–4″ long, on capillary pedicels; scales 5, the outer 2 empty, abruptly long-acuminate, the first 1-nerved, the second 3-nerved, the third and fourth scales about 2½″ long, rough, ciliate on the margins with ascending hairs, 5-nerved, acute, usually awn-pointed, the fifth scale smaller, smooth, hispidulous at the apex, sometimes awn-pointed.

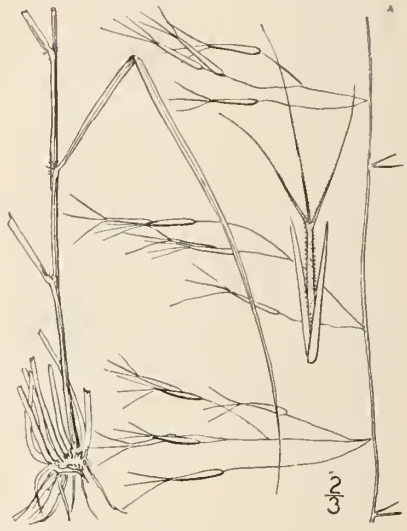
Along brackish marshes, New York City. July-Aug.

[Vol. 1: p. 136.] **10a. Aristida divaricàta** H. & B. Spreading Aristida. (Fig. 306a.)

Aristida divaricata H. & B.; Willd. Enum. Hort. Berol. 99. 1809.

Culms 1½°–3° tall, tufted, erect. Sheaths overlapping, rough, usually with a tuft of long hairs on each side at the apex; ligule a short ciliate ring; leaves smooth beneath, rough above, those of the culm 6′–12′ long, 1″–2″ wide, erect or asceuding; the sterile shoots from one-third to one-half as long as the culm, the leaves narrower; *panicle comprising one-half of the plant, or more*, often included at the base, *its branches rigid, at length widely spreading;* spikelets, exclusive of the awns, about ½′ long, numerous; empty scales acuminate, usually awn-pointed; flowering scale commonly slightly shorter than the empty ones, firm, sometimes spotted with purple, hispidulous above; *awns not articulated to the scale*, the lateral ones shorter than the central, which is 6″–10″ long; callus pilose.

Dry sandy soil, Kansas to Arizona and New Mexico, south to Mexico.



[Vol. 1: p. 159.] **1a. Agrostis coarctàta** Ehrh. Dense-flowered Bent-grass. (Fig. 362a.)

Agrostis coarctata Ehrh.; Hoffm. Deutsch. Fl. Ed. 2, 1: 37. 1800.

Glabrous. Culms tufted, erect, or decumbent at the base and often rooting at the lower nodes, smooth, 12′–20′ tall, at length branching; sheaths shorter than the internodes; ligule scarious, ½″–1″ long; leaves erect, rough on both surfaces, 1½′–3½′ long, 1½″ or less wide; *panicle dense and contracted*, 1½′–4′ long, ¼′–½′ thick, *its branches erect, the longer* 1¼′ *long or less;* spikelets numerous, crowded, acute at both ends and lanceolate when closed, 1″–1¼″ long, on shorter hispidulous pedicels which are much thickened at the apex; empty scales acute, hispidulous on the upper part of the keel, especially in the first scale; flowering scale hyaline, about three-quarters as long as the spikelet, denticulate at the truncate or rounded apex; palet about one-half as long as the scale.

Maine to New Jersey. Also in Europe. July-Sept.

[Vol. 1: p. 160.] 4a. **Agrostis rupéstris** Allioni. Rock Bent-grass. (Fig. 365a.)

Agrostis rupestris Allioni, Fl. Pedem. 2: 237. 1785.

Culms tufted, 6′ *or less tall*, slender, erect, or decumbent at the base, smooth and glabrous. Sheaths longer than the internodes; ligule about ½″ long; leaves smooth and glabrous, *those on the culm* 1′ *or less long*, the basal leaves from one-third to one-half as long as the culms; *panicle contracted*, 1′ *or less long*, its axis and branches smooth, the latter erect or nearly so, spikelet-bearing above the middle; spikelets about 1″ long; empty scales about equal, 1-nerved, acute, usually purple, hispidulous on the keel; flowering scale shorter, hyaline, denticulate at the obtuse or truncate apex, bearing about the middle a dorsal scabrous awn a little over 1″ long; palet wanting.

Labrador and the high mountains of Nevada. Also in Europe. Summer.

[Vol. 1: p. 174.] 2a. **Danthonia glàbra** Nash. Smooth Wild Oat-grass. (Fig. 398a.)

Danthonia glabra Nash, Bull. Torr. Club, 24: 43. 1897.

Glabrous. Culms erect, tufted, 16′–28′ tall, slightly roughened just below the panicle and puberulent below the brown nodes; sheaths usually shorter than the internodes; ligule densely ciliate with long silky hairs; leaves smooth excepting at the apex, 1″–2″ wide, erect, those on the sterile shoots 6′ or more long, the culm leaves 2′–4′ long; panicle 2′–3′ long, contracted; spikelets, including awns, 9″–10″ long, 5–10-flowered, on hispidulous appressed pedicels; empty scales acuminate; flowering scales 2½″–3″ long to the base of the teeth, *pilose on the margins below* and sometimes sparingly so on the midnerve at the base, *the remainder of the scale glabrous*, teeth, including the awns, 1″–1½″ long, the central awn 4½″–6″ long, more or less spreading.

In swamps, southern New Jersey to Georgia. May–July.

[Vol. 1: p. 185.] 2a. **Sieglingia albéscens** (Vasey) Kuntze. White Sieglingia. (Fig. 422a.)

Tricuspis albescens Munro; A. Gray, Proc. Phila. Acad. Nat. Sci. 1862: 335. Name only. 1863.
Triodia albescens Vasey, Bull. U. S. Dept. Agric. Div. Bot. 12: Part 2, 33. 1891.
Sieglingia albescens Kuntze; L. H. Dewey, Contr. U. S. Nat. Herb. 2: 538. 1894.

Culms tufted, erect, smooth and glabrous, 12′–20′ tall, the sterile shoots one half as long as the culm or more. Sheaths shorter than the internodes, smooth; ligule a ring of short hairs; leaves smooth beneath, roughish above, acuminate, 2½′–11′ long, 1″–2″ wide; panicle dense and contracted, *white*, 2½′–5′ long, ¼′–¾′ broad, its branches erect or ascending, 1′ or less long; spikelets about 7–11-flowered, 2″–2½″ long, the empty scales white, 1-nerved, about equal; flowering scales about 1½″ long, 3-nerved, the lateral nerves vanishing below the apex, *all the nerves glabrous*, the midnerve excurrent in a short scabrous point, denticulate and irregularly and obscurely lobed at the truncate apex, short-pilose on the callus.

Prairies, Kansas to Texas. Aug.–Sept.

[Vol. 1: p. 185.] 2b. **Sieglingia elongàta** (Buckley) Nash. Long-panicled Sieglingia. (Fig. 422b.)

Uralepis elongata Buckley, Proc. Phila. Acad. Sci. 1862: 89. 1863.

Tricuspis trinerviglumis Munro; A. Gray in Proc. Phila. Acad. Nat. Sci. 1862: 333. Name only. 1863.

Culms 1°–3° tall, tufted, erect, rough, the sterile shoots about ½ as long as the culms. Sheaths rough, longer than the internodes, a ring of hairs at the apex, the lower sheaths usually sparingly papillose-pilose; ligule a ring of hairs; leaves rough, usually involute when dry, 3′–10′ long, 1″–2″ wide; panicle narrow, 5′–10′ long, ½′ wide, its branches erect, 1½′ or less long, usually exceeding the rachis-internodes; spikelets 10–12-flowered, 4½″–6″ long, the empty scales scabrous, hispidulous on the midnerve, the first 1-nerved, the second 3-nerved; flowering scales about 3″ long, *obtuse at the scabrous apex*, 3-nerved, the lateral nerves vanishing at or below the apex, the midnerve usually excurrent in a short point, *all the nerves pilose below the middle*.

Prairies, Kansas to Arizona and Texas. June–Aug.

[Vol. 1: p. 185.] 2c. **Sieglingia pilòsa** (Buckley) Nash. Sharp-scaled Sieglingia. (Fig. 422c.)

Uralepis pilosa Buckley, Proc. Phila. Acad. Nat. Sci. 1862: 94. 1863.

Tricuspis acuminata Munro; A. Gray in Proc. Phila. Acad. Nat. Sci. 1862: 335. Name only. 1863.

Culms tufted, 2½′–12′ tall, smooth and glabrous, the sterile shoots 4′ tall or less. Sheaths smooth, a tuft of hairs on each side at the apex, much shorter than the internodes; ligule a ring of short hairs; leaves strict or curved, thick, linear, obtuse, 1-nerved, the margins white, serrulate, 1½′ long or less, less than 1″ wide, folded, at least when dry, pubescent with long hairs, especially beneath; panicle almost racemose, long-exserted, ½′–1½′ long; spikelets 3–10, crowded, 8–12-flowered; empty scales acuminate, 1-nerved; flowering scales 3″–3¼″ long, *acuminate*, *3-nerved*, the midnerve generally excurrent in a short point, all the nerves (the *lateral at the top and bottom*, the midnerve *below the middle*), the callus, and the base pilose.

Dry soil, Kansas to Colorado, Texas and New Mexico. April-Sept.

[Vol. 1: p. 208.] 21a. **Poa arachnífera** Torr. Texas Blue-grass. (Fig. 479a.)

Poa arachnifera Torr. Marcy's Exped. 301. 1853.

Culms tufted, 1°–3° tall, smooth and glabrous, from running rootstocks; sterile shoots from one-half as long as the culms to equalling them. Sheaths longer than the internodes, smooth or roughish, hyaline on the margins; ligule a short membranous ring; leaves linear, erect, usually folded when dry, smooth beneath, rough above, 1½′–9′ long, 1½″–3″ broad, abruptly acute; panicle dense and contracted, sometimes interrupted below, 3′–6½′ long, ½′–1½′ broad, its branches ascending or erect; spikelets numerous, 4–7-flowered, *the scales acuminate*, the empty ones hispidulous on the midnerve; flowering scales 2″–2½″ long, often pointed, pubescent at the base with *copious long cobwebby hairs*, *5-nerved*, the *midnerve* and *lateral nerves* pilose below the middle.

Prairies, Kansas to New Mexico, south to Louisiana and Texas. Also introduced in Florida. April–May.

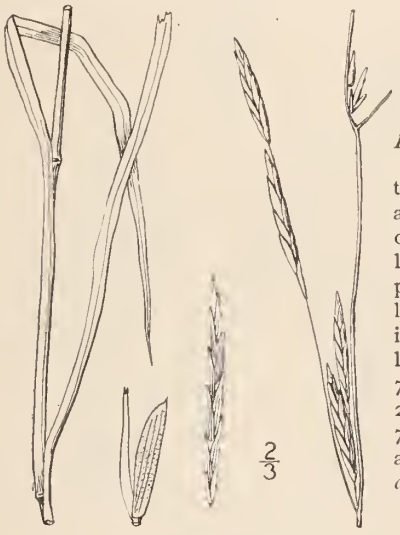
[Vol. 1: p. 213.] 8a. **Panicularia boreàlis** Nash. Northern Manna-grass. (Fig. 491a.)

Glyceria fluitans var. *angustata* Vasey, Proc. Port. Soc. Nat. Hist. 2: 91. 1895. Not *G. angustata* T. Fries. 1869.

P. borealis Nash, Bull. Torr. Club, 24: 348. 1897.

Glabrous. Culms erect from a creeping base, 1½°–5° tall; sheaths overlapping, smooth or roughish, the uppermost one enclosing the base of the panicle; ligule 2½″–7½″ long, membranous; leaves linear, abruptly acuminate, 3½′–21′ long, 1″–5″ wide; panicle slender, narrow, the exserted portion 6′–20′ long, its branches appressed or nearly so, the lower in 2's or 3's, the longer of which bear 5–12 spikelets; *spikelets 5″–9″ long*, 7–13-flowered, appressed; outer two scales empty, 1-nerved, smooth and shining, unequal; flowering scales *thin*, 2″–2½″ long, 7-nerved, the *nerves hispidulous*, a broad scarious margin at the obtuse and erose apex; palet hyaline, slightly *shorter* than the scale, shortly 2-toothed at the obtuse apex.

In shallow water, Maine to New York, Idaho, California, Washington, and northward.



[Vol. 1: p. 213.] 9a. **Panicularia brachyphýlla** Nash. Short-leaved Manna-grass. (Fig. 492a.)

P. brachyphylla Nash, Bull. Torr. Club, 24: 349. 1897.

Glabrous. Culms erect from a creeping base, 2°–3° tall; sheaths generally longer than the internodes, almost closed, the uppermost one enclosing the base of the panicle; ligule 3″–4½″ long, membranous; leaves linear, acuminate, 2½′–5′ long, 2″–2½″ wide; panicle slender, narrow, the exserted portion 12′–16′ long, its branches appressed or nearly so, the lower in 2's or 3's, the longer of which bear 2 or 3 spikelets; spikelets compressed-cylindric, 10″–14″ *long*, 7–12-flowered; empty scales 1-nerved, the second 2½″–3″ long; flowering scales *hispidulous all over*, 7-nerved, about 2½″ long, the obtuse apex obscurely and irregularly few-toothed; palet about 3″ long, *acuminate, a little exceeding the scale.*

In shallow water, New York. June–July.

[Vol. 1: p. 217.] 4a. **Festuca brachyphýlla** Schultes. Short-leaved Fescue-grass. (Fig. 500a.)

Festuca brevifolia R. Br. Append. Parry's Voy. Suppl. 289. 1824. Not Muhl. 1817.

Festuca brachyphylla Schultes, Mant. 3: Addit. 1, 646. 1827.

Festuca ovina L. var. *brevifolia* S. Wats. in King's Rep. U. S. Geol. Expl. 40th Paral. 5: 389. 1871.

Smooth and glabrous. Culms densely tufted, 8′ *or less tall*, slender, erect, much exceeding the short basal leaves; sheaths coarsely striate; ligule a short scarious ring; leaves very narrow, involute, at least when dry, *those on the culm ½′ or less long*, erect or ascending; *panicle 1′ or less long*, nearly simple, its branches appressed; *spikelets 2–4-flowered*, the empty scales acuminate, the first 1-nerved, the second 3-nerved; flowering scales acute or acuminate, rough toward the apex, 2″–2½″ long, exclusive of the scabrous awn which is ½″–1¼″ long.

Newfoundland to British Columbia, the higher mountains of Vermont, and the Rocky Mountains to Colorado. Summer.

[Vol. 1: p. 217.] **4b. Festuca capillàta** Lam. Filiform Fescue-grass. (Fig. 500b.)

Festuca capillata Lam. Fl. Franc. 3: 598. 1778.

Densely tufted. Culms erect with a decumbent base, 6′–15′ tall, slender, smooth and glaucous, shining; sheaths smooth, longer than the internodes, confined to the base of the culm; ligule a short membranous ring; *leaves filiform*, smooth or rough, the basal ones from one-third to one-half as long as the culm, the culm leaves 1′–1½′ long; panicle contracted, ½′–2′ long, its branches erect, ½′ or less long; spikelets 2″–2½″ long, 4–5-*flowered;* outer scales empty, unequal, the first acuminate, the second acute; flowering scales *about* 1¼″ *long*, *unawned*, *acute*.

Fields and roadsides, Maine and New York. Introduced from Europe. June–July.

[Vol. 1: p. 220.] **4a. Bromus Madritén-sis** L. Compact Chess. (Fig. 509a.)

Bromus Madritensis L. Amoen. Acad. 4: 265. 1755.

Culms 1°–2° tall, tufted, smooth and glabrous. Sheaths smooth, glabrous, or the lower ones pubescent, usually shorter than the internodes; ligule scarious, lacerated, 1″–2″ long; leaves 2½′–8′ long, 1½″–3″ wide, rough above, often pubescent on both surfaces; panicle dense, 3′–6′ long, its rough branches erect or ascending, the longer 2′–3′ long; spikelets *numerous*, 1½′–2′ long, including the awns, the scales acuminate, scarious on the margins, the first scale 1-nerved, the second 3-nerved; flowering scales, exclusive of the awn, 6″–7″ *long*, *sparsely and minutely appressed-pubescent*, *the apex acuminately 2-toothed*, 5-nerved, bearing an erect or divergent awn 6″–9″ long.

Waste places, Michigan and Virginia; also in California. Locally adventive from Europe. Summer.

[Vol. 1: p. 222.] **10a. Bromus arvénsis** L. Field Chess or Brome. (Fig. 515a.)

Bromus arvensis L. Sp. Pl. 77. 1753.

Culms erect, 1°–3° tall, smooth and shining, glabrous except at or near the brown nodes. Sheaths shorter than the internodes, *softly and densely pubescent with short reflexed hairs;* ligule scarious, ½″–1½″ long; leaves erect or ascending, more or less hirsute on both surfaces, 3′–6′ long, 2″–3″ wide; panicle ample, 5′–9′ long, its rough branches erect or ascending, rarely spreading, branching and spikelet-bearing above the middle, the longer 3′–6′ long; spikelets, including the awns, 9″–12″ long, lanceolate, somewhat shining, the scales membranous, scarious on the margins, minutely and sparsely appressed-pubescent toward the acute apex, papillose along the nerves, the first scale 3-nerved, the second 5-nerved; flowering scales broadest at the middle, 5-nerved, 3½″–4″ long, bearing an erect awn of about the same length.

Fields and waste places, New York, New Jersey and Michigan. Locally adventive from Europe. Summer.

[Vol. 1: p. 226.] **1a. Agropyron pseudorèpens** Scribn. & Sm. False Couch-grass. (Fig. 524a.)

Agropyron pseudorepens Scribn. & Sm. Bull. U. S. Dept. Agric. Div. Agrost. 4: 34. 1897.

Light green. Culms 1°–3° tall, erect, smooth and glabrous, from a running rootstock; sheaths shorter than the internodes, smooth; ligule a short membranous ring; leaves erect, prominently nerved, *rough on both surfaces*, acuminate, the culm leaves 3′–8′ long, 2″–3″ wide, the basal leaves about one-half as long as the culms; spikes 3′–8′ long, strict; spikelets 5″–8″ long, 3–7-flowered, *a little compressed, appressed to the rachis* which is hispidulous on the margins; empty scales lanceolate, equalling or somewhat shorter than the spikelet, acuminate and often awn-pointed, 5–7-nerved, the nerves hispidulous; flowering scales 5-nerved, roughish toward the apex, usually awn-pointed.

Rich river bottoms, Montana to British Columbia, south to Nebraska, Arizona and Texas. July–Aug.

[Vol. 1: p. 226.] **1b. Agropyron spicàtum** (Pursh) Scribn. & Sm. Western Wheat-grass. (Fig. 524b.)

Festuca spicata Pursh, Fl. Am. Sept. 1: 83. 1814.
Agropyron spicatum Scribn. & Sm. Bull. U. S. Dept. Agric. Div. Agrost. 4: 33. 1897.

Pale green, glaucous. Culms 1½°–4° tall, erect, from a slender creeping rootstock, smooth and glabrous; sheaths shorter than the internodes, smooth; ligule a short membranous ring; leaves erect, 2′–8′ long, 2″–4″ wide, acuminate, very scabrous above, smooth beneath, becoming involute when dry; spike long-exserted, strict, 4′–8′ long; spikelets crowded, *divergent from the rachis, compressed*, lanceolate when closed, ½′–1′ long, 6–12-flowered; empty scales acuminate, awn-pointed, shorter than the spikelet, hispidulous on the keel; flowering scales 5″–6″ long, acute or awn-pointed, glabrous or sparsely pubescent.

Moist land, Manitoba and Minnesota to Oregon, south to Missouri and Texas.

[Vol. 1: p. 226.] **1c. Agropyron tetrástachys** Scribn. & Sm. Coast Wheat-grass. (Fig. 524c.)

Agropyron tetrastachys Scribn. & Sm. Bull. U. S. Dept. Agric. Div. Agrost. 4: 32. 1897.

Glaucous. Culms rigid, sleuder, erect, 1½°–3° tall, from a running rootstock; sheaths shorter than the innodes, smooth and glabrous; ligule wanting; leaves erect, acuminate, 5′–8′ long, 2″ or less wide, smooth beneath, glaucous above, scabrous on the margins; spikes long-exserted, 3′–5′ long, 4-*sided;* spikelets crowdcd, 6″–10″ long, 6–11-flowered, appressed to the 4-*angled articulated rachis*, the angles hispidulous; empty scales lanceolate, 5″ long, rough on the keel, 5–7-uerved; flowering scales lanceolate, kecled, rough toward the apex, acute, awn-pointed or short-awned.

Sandy beaches, coast of Maine. July–Aug.

[Vol. 1: p. 228.] **5a. Agropyron Gmélini** Scribn. & Sm. Gmelin's Wheat-grass. (Fig. 528a.)

Agropyron Gmelini Scribn. & Sm. Bull. U. S. Dept. Agric. Div. Agrost. 4: 30. 1897.

Culms 1½°–4° tall, erect, *stender*, tufted, smooth and glabrous, *no rootstocks*. Sheaths smooth, usually longer than the internodes; ligule a short membranous ring; *leaves erect*, 4′–10′ long, 1″–3″ wide, acuminate, smooth beneath, scabrous on the margins and sometimes also sparsely so above; spike slender, long-exserted, 2′–8′ long; spikelets 6-20, somewhat crowded, appressed to the rachis, more or less compressed, 5-9-*flowered;* empty scales 5″–7″ long, shorter than the spikelet, acuminate into a shorter awn; flowering scales 4″–6″ long, acuminate, bearing at or just below the apex a slender scabrous awn 7″–15″ long.

Bottom lands, Washington to western Nebraska.

[Vol. 1: p. 231.] **3a. Elymus intermèdius** (Vasey) Scribn. & Sm. Strict Wild Rye. (Fig. 535a.)

Elymus Canadensis var. *intermedius* Vasey; Wats. & Coult. in A. Gray, Man. Ed. 6, 673. 1890.
Elymus intermedius Scribn. & Sm. Bull. U. S. Dept. Agric. Div. Agrost. 4: 38. 1897.

Culms erect from a perennial root, 2°–3° tall, smooth and glabrous. Sheaths longer than the internodes, smooth, the uppermost often inflated and enclosing the base of the spike; ligule a short membranous ring; leaves 7′–12′ long, 4″–9″ wide, acuminate, very rough on both surfaces; spikes 2½′–6′ long, stout, the rachis pubescent; spikelets crowded, in pairs, 2–5-flowered; *empty scales linear*, 5″–6″ long, thick, 3–5-nerved, *the nerves hirsute*, acuminate into a scabrous awn as long as or shorter than the scale; flowering scales lanceolate, 5-nerved, *appressed-hirsute*, 4″–5″ long, acuminate into *a rough awn 6″–8″ long*.

River banks, Maine to Virginia, west to Illinois and Nebraska. July–Aug.

[Vol. 1: p. 231.] **3b. Elymus robústus** Scribn. & Sm. Stout Wild Rye. (Fig. 535b.)

Elymus robustus Scribn. & Sm. Bull. U. S. Dept. Agric. Div. Agrost. 4: 37. 1897.

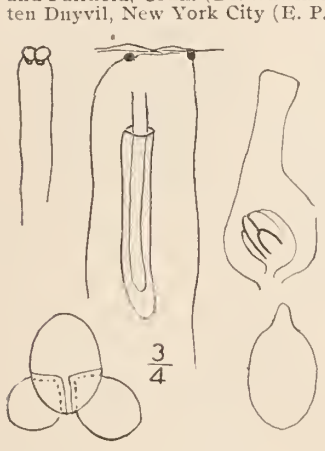
Culms erect, usually stout, 3°–6° tall, smooth and glabrous. Sheaths longer than the internodes, smooth or slightly roughened; ligule a short coriaceous ring with acute lateral auricles; leaves firm, very rough on both surfaces, 4′–15′ long, 4″–10″ wide, acuminate; spike little exserted, *stout*, 4′–9′ long, the rachis usually glabrous except on the angles; spikelets numerous, crowded, *in* 2's–4's, 3–4-flowered; empty scales subulate, 5″–6″ long, bearing an awn 6″–9″ long; flowering scales lanceolate, 5″–6″ long, 2-toothed at the apex, from sparsely to densely appressed-pubescent, bearing *a flexuous or bent awn 15″–24″ long*.

River banks, Ontario and Vermont to Oregon, south to North Carolina, Texas and Arizona.

[Vol. 1: p. 268.] **19a. Scirpus Nòvae-Ángliae** Britton. New England Coast Sedge. (Fig. 627a.)

Perennial by rootstocks; culm stout, erect, 4°–7° *tall*, sharply 3-angled, the sides flat or nearly so. Leaves long, 4″–6″ wide, somewhat roughish on the margins when dry, the lowest reduced to pointed sheaths, those of the involucre 2–5, the longer of them much exceeding the inflorescence; *spikelets narrowly cylindric, acute, ¾′–2′ long, less than ¼′ thick*, solitary or 2–5 together at the ends of the rays of the umbel, *the rays 1′–4′ long*; scales awned; bristles 2–4, shorter than the *grayish-white dull obovate achene*, which is distinctly 3-angled; stamens 3; style 3-cleft.

In fresh water and brackish marshes, Stratford and Fairfield, Conn. (Dr. Edwin H. Eames), Spuyten Duyvil, New York City (E. P. Bicknell).



[Vol. 1: p. 366.] **2a. Lemna mínima** Philippi. Least Duckweed. (Fig. 886a.)

Lemna minima Philippi, Linnaea, 33: 239. 1844.

Thallus oblong to elliptic, 1″–2″ long, obscurely 1-*nerved, or nerveless, with a row of papules along the nerve, the lower surface flat, or slightly convex;* the apex rounded, rootcap usually short, a little curved, rarely perfectly straight, *cylindric, blunt;* spathe open; pistil short-clavate; stigma concave; ovule solitary, obliquely orthotropous; seed oblong, pointed, about 16 ribbed, with many transverse striations.

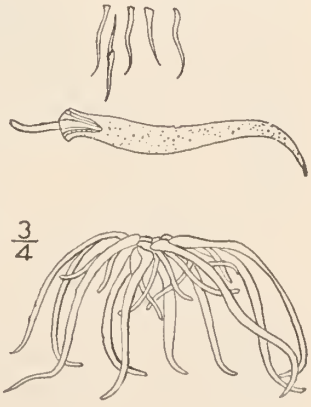
Georgia and Florida to Kansas, Wyoming and California.

[Vol. 1: p. 367.] **2a. WOLFFIÉLLA** Hegelm. Engler's Bot. Jahrb. **21**: 303. 1895.

Thallus thin, unsymmetrical, rootless, curved in the form of a segment of a band, punctate on both surfaces with numerous brown pigment-cells. Pouch opening as a cleft in the basal margin of the thallus, a stipe attached to its margins. Flowers and fruit unknown. [Diminutive of *Wolffia*.]

About 7 species, mostly of tropical regions. Besides the following, 2 others are known from western North America.

1. Wolffiella Floridàna (J. D. Smith) Thompson. Florida Wolffiella. (Fig. 889a.)



Wolffia gladiata var. *Floridana* J. D. Smith, Bull. Torr. Club, 7: 64. 1880.

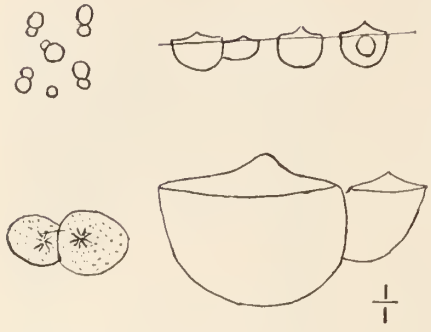
Wolffia Floridana J. D. Smith; Hegelm. Engler's Bot. Jahrb. 21: 305. 1895.

Wolffiella Floridana Thompson, Ann. Rep. Mo. Bot. Gard. 9: 17. 1897.

Thalli solitary, or commonly cohereut for several generations forming densely interwoveu masses, strap-shaped, scythe-shaped, or doubly curved, tapering from the rounded oblique base to a long-attenuate apex, 2½″–5″ long, 14–21 times as long as wide; basal portion of the long stipe persistent, the pouch elongated-triangular, or the upper angle rounded.

Georgia and Florida to Missouri, Arkansas and Texas.

[Vol. 1: p. 367.] **2a. Wolffia papulífera** Thompson. Pointed Duckweed. (Fig. 891a.)



Wolffia papulifera Thompson, Ann. Rep. Mo. Bot. Gard. 9: 20. *pl. 4D.* 1897.

Thallus slightly unsymmetrical, obliquely broadly ovate, about ½″ broad, the apex rounded, *the upper surface flat at the margin, gradually ascending into a prominent conic papule on the median line*, brown-punctate, the under surface strongly gibbous, less punctate; stomata numerous on the upper surface; flower and fruit unknown.

Floating, with the entire upper surface exposed to the air, Kennett and Columbia, Mo.

[Vol. 1: p. 377.] **1a. Tradescantia bracteàta** Small. Long-bracted Spiderwort. (Fig. 910a.)

Perennial, deep green, glabrous to the inflorescence, or nearly so. Stems erect, 4′–10′ tall, simple or sparingly branched; leaves linear to linear-lanceolate, 4′–8′ long, long-acuminate; sheaths paler than the leaf-blades, conspicuously ribbed, glabrous, or the upper ones sometimes ciliate; *involucres of 2 bracts, these broader than the leaves*, more or less strongly saccate at the base, ciliate and often sparingly villous on the back; umbel-like cymes few-flowered; *pedicels glandular-pubescent, ½′–1′ long; sepals ovate-lanceolate to elliptic-lanceolate, glandular*, more or less involute; corolla blue or reddish, about 1′ broad.

In sandy soil, Minnesota to South Dakota, south to Kansas. Spring and summer. Ascends to 7500 feet in the Black Hills.

[Vol. 1: p. 377.] **2a. Tradescantia refléxa** Raf. Reflexed Spiderwort. (Fig. 911a.)

Tradescantia reflexa Raf. Atl. Journ. 150. 1832.

Perennial, glabrous, *glaucous*. Stems erect, 1°–3° tall, nearly straight, commonly much branched; leaves linear, 8′–20′ long, straight, or somewhat curved, long-attenuate; sheaths large, 5″–15″ long; *involucres of 2 unequal finally reflexed leaf-like bracts;* umbel-like cymes usually dense at maturity; *pedicels slender, 10″–13″ long, recurved;* sepals oblong or elliptic, apparently lanceolate by the involute edges, 4″–5″ long, hooded, *mostly with a tuft of hairs at the apex;* corolla blue or red, 10″–15″ broad, *the petals suborbicular;* capsule ovoid to oblong, 2½″–3″ long, glabrous.

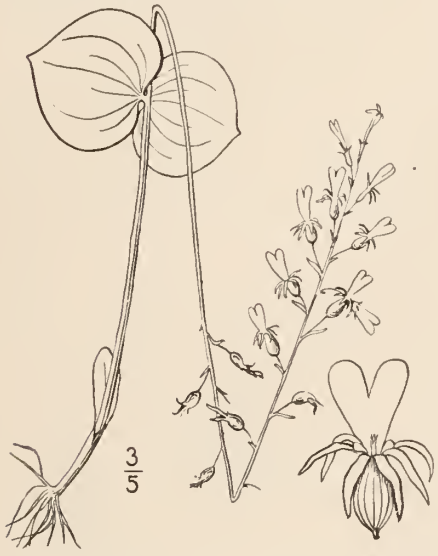
In sandy or clayey soil, Minnesota to Florida and Texas. Spring and summer.

[Vol. 1: p. 436.] **1a. Trillium víride** Beck. Green Wake-robin. (Fig. 1043a.)

Trillium viride Beck, Am. Journ. Sci. II: 178. 1826.

Perennial by a short corm-like rootstock, light green. Stems solitary, or several together, 4′–15′ tall, rough-pubescent near the top, or glabrous in age; leaves oblong to ovate, 2′–4′ long, obtuse or acutish, 3–5-nerved, *usually blotched*, more or less pubescent on the nerves beneath; *flowers sessile;* sepals linear or linear-lanceolate, 1′–2′ long, bright green, acute or obtuse; *petals clawed, the blades linear or nearly so, surpassing the sepals, light green or purplish green*, the claws sometimes brown or purple; stamens about ⅓ as long as the petals; filaments flattened, ¼–⅕ shorter than the anthers.

In woods and glades, Missouri and Tennessee to Mississippi and Arkansas. Spring.



[Vol. 1: p. 473.] **1a. Listera reniformis** Small. Kidney-leaf Twayblade. (Fig. 1128a.)

L. reniformis Small, Bull. Torr. Club, 24: 334. 1897

Perennial, deep green. Stems erect, 4′–12′ tall, slender, glabrous below, densely glandular-pubescent above; leaves 2, opposite, about the middle of the stem, *reniform, or ovate-reniform, 5″–14″ broad, apiculate or short-acuminate*, more or less pubescent beneath, *cordate or subcordate at the base, sessile;* racemes ¾′–4′ long; bracts lanceolate to ovate-lanceolate, 1½″–2½″ long, acute; pedicels 2″–4″ long, less densely pubescent than the adjacent stem, or glabrate; sepals oblong or linear-oblong, about 1½″ long, reflexed; corolla greenish, *the lip wedge-shaped, 3″–3½″ long, with 2 prominent teeth near the base, sharply cleft*, the segments obtuse; capsules oval, 2″–2½″ long.

In damp thickets in the mountains, Maryland, Virginia and North Carolina. Spring and summer.

[Vol. 1: p. 485.] **4a. Hicoria Carolinae-septentrionàlis** Ashe. Southern Shag-bark. (Fig. 1154a.)

Hicoria Carolinae-septentrionalis Ashe, Notes on Hickories. 1896.

A small tree attaining a maximum height of about 80°, and diameter of 2½°, with gray bark hanging in long loose strips. Bud-scales 8–10, imbricate, the inner greatly enlarging in leafing, and tardily deciduous; terminal bud ovate-lanceolate, truncate, the scales spreading, *barely ⅓′ long;* lateral buds oblong; *twigs very slender, ⅛′ thick, glaucous, smooth, purplish-brown;* staminate aments in threes, glabrous on short peduncles, at base of shoots of the season; *stamens glabrous; ovary glabrous;* young foliage blackening in drying, glabrous, ciliate, with few resinous globules; *leaflets* 3–5, *the 2 upper ¾′–1¼′ wide, 4′–6′ long, lanceolate;* lower pair often smaller; *fruit subglobose, ¾′–1¼′ long;* husk soon falling into 4 pieces; nut white or *brownish, much compressed*, angled, *cordate or subcordate at top*, thin-shelled; seed large and sweet.

Sandy or rocky woods, rarely entering "bottoms," Delaware to Georgia and Tennessee.

[Vol. 1: p. 486.] 6a. **Hicoria villòsa** (Sarg.) Ashe. Scurfy Hickory. Woolly Pignut. (Fig. 1156a.)

H. glabra var. *villosa* Sarg. Sylva, 7: 167. 1895.
Hicoria pallida Ashe, Notes on Hickories. In part. 1896.
H. villosa Ashe, Bull. Torr. Club, 24: 11, 530. 1897.

A small or medium sized tree reaching a maximum height of about 80°, and a diameter of 2°, with deeply furrowed dark gray bark. Buds of 6–8 imbricated scales, the outer usually thickly *dotted with resinous globules*, the inner somewhat enlarging in leafing; terminal bud ovate, ¼′ long, *lateral buds mostly short-stiped;* staminate aments pubescent, and *gland* and *scurf covered*, peduncled in 3's at base of shoots of the season; twigs slender, ⅛′ thick or less, usually glabrous, *bright purple-brown;* petiole pubescent; *leaflets* 5–9, *at first thickly covered beneath with silvery peltate glands, mixed with resinous globules*. generally pubescent; fruit about 1′ long, obovoid or subglobose, *the husk dotted with resinous globules*, ⅛′ thick and partly splitting; nut brown, thick-shelled, angled; seed small, but sweet.

Poor sandy or rocky soils, Delaware to Georgia (according to Ashe), west to Missouri. Wood hard, strong, dark brown; weight per cubic foot 50 lbs.

Hicoria villòsa pállida Ashe.

Hicoria pallida Ashe, Notes on Hickories. In part. 1896.

Less pubescent; fruit ovoid, *flattened laterally; husk thin, splitting to the base;* nut light brown, *not angled*. Virginia to Georgia.

[Vol. 1: p. 487] after Hicoria glàbra add Hicoria glàbra hirsùta Ashe, Notes on Hickories. 1896.

Similar to type, but leaves larger, *pubescent beneath, thinner*, generally destitute of resinous globules on the lower surface; fruit larger. Virginia to Georgia, along and near the mountains.

[Vol. 1: p. 486.] 6b. **Hicoria boreàlis** Ashe. Northern Hickory. (Fig. 1156b.)

Hicoria borealis Ashe, Notes on Hickories. 1896.

A small tree, with rough furrowed bark when young, becoming shaggy in long narrow strips with age. Bud-scales 8–10, imbricated, the inner bright-colored and sericeous, enlarging in leafing and tardily deciduous; terminal bud *ovate-lanceolate*, ½′ long; twigs very slender, ⅛′ thick, glabrous, *bright brownish red;* staminate aments in 3's at base of shoots of season; *middle lobe of staminate calyx much prolonged; young foliage blackening in drying, pubescent when young*, becoming smooth, *ciliate, with few resinous globules on lower surface;* leaflets 5, occasionally 3, lanceolate, the upper ¾′–1¼′ wide, 3½′–6′ long; lower pair often smaller; fruit ovoid, *much flattened*, ¾′ or more long; husk very thin, rugose, coriaceous, usually not splitting; *nut white*, somewhat angled; *shell thin* and *elastic;* seed large, sweet and edible.

A small tree of dry uplands, growing with oaks and *Hicoria microcarpa*. Southern and eastern Michigan, east to Belle Isle, Detroit river. Probably also in southern Ontario.

[Vol. 1: p. 537.] 2a. **NESTRÒNIA** Raf. New Flora, 3: 12. 1836.

[Darbya A. Gray, Am. Journ. Sci. (II) 1: 388. 1846.]

A low glabrous dioecious shrub, with opposite short-petioled, oblong to ovate entire leaves. Staminate flowers small, in axillary peduncled umbels; calyx top-shaped, 4–5-cleft, the lobes spreading, each with a tuft of wool; stamens as many as the calyx-segments and opposite them; disk crenate. Pistillate flowers solitary in the axils, short-peduncled; calyx narrowly top-shaped, 4-lobed; stamens 4; style short, 4-lobed; ovary adnate to the calyx. Fruit an oval 1-seeded drupe. [From the Greek name of *Daphne*.]

A monotypic genus of the southeastern United States.

1. Nestronia umbéllula Raf. Nestronia. (Fig. 1276a.)

Nestronia umbellula Raf. New Flora, 3: 13. 1836. *Darbya umbellulata* A. Gray, Am. Journ. Sci. (II.) 1: 388. 1846.

Shrub 1°–3° high, branching. Leaves thin, 1′–2′ long, acute or obtuse at the apex, narrowed or rounded at the base, pinnately veined, bright green above, petioles 1″–3″ long; peduncles of the staminate 3–9-flowered umbels filiform, nearly or quite one-half as long as the leaves, the pedicels about 2″ long, equalling the green calyx; stamens shorter than the oblong-ovate calyx-segments; pistillate calyx glaucescent, about 3″ long, the lobes much shorter than the tube; drupe about ½′ in diameter.

In woods and along streams, Virginia to Georgia and Alabama. April–May.

[Vol. 1: p. 538.] **1a. Asarum acuminàtum** (Ashe) Bicknell. Long-tipped Wild Ginger. (Fig. 1277a.)

A. Canadense var. *acuminatum* Ashe. Oct. 1897.

Similar to *A. Canadense* but more pubescent, at least when young. Leaves thin and membranous, reniform-cordate and acutely short-pointed or broadly reniform and blunt, at first densely cinerous tomentulose on the lower surface, less so when old, the larger veins often densely divaricate-pubescent, giving the leaves beneath a coarsely white-reticulated appearance; *calyx-lobes much longer than in A. Canadense and duller brownish-purple, caudate-acuminate, or flagellate, the slender terminations recurved-spreading, often flexuous, 5″–10″ long.*

Rich woods, Minnesota and Wisconsin to Iowa, Indiana and Ohio. May–June.

[Vol. 1: p. 538.] **1b. Asarum refléxum** Bicknell. Short-lobed Wild Ginger. (Fig. 1277b.)

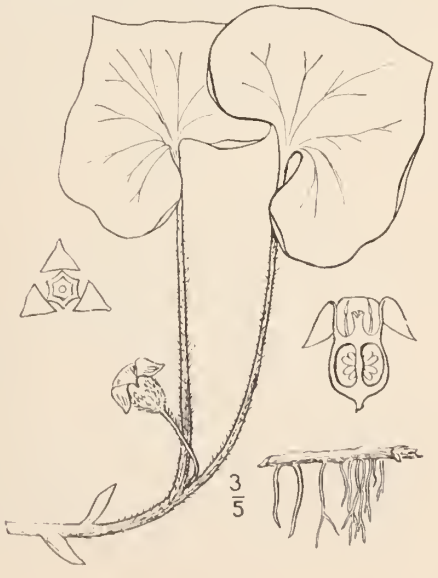
Asarum reflexum Bicknell, Bull. Torr. Club, 24: 533. *pl. 317.* 1897.

Similar to *A. Canadense*, more loosely pubescent, rootstocks more elongated, slender. Leaves reniform, broader than long, the basal sinus shallow or deep, obtusely pointed, the upper surface commonly nearly glabrous, the petioles often nearly glabrous in age; flowers smaller than those of *A. Canadense*, the calyx-tube white within; *lobes of the calyx-limb early reflexed*, purplish-brown, 4″–5″ long, about as long as the tube, *triangular*, with a straight obtuse tip, 1″–2″ long.

In rich woods, along streams or river valleys, often forming large patches, Connecticut and southeastern New York to Iowa, North Carolina, Missouri and Kansas. April–May.

Asarum refléxum ambíguum Bicknell, Bull. Torr. Club, 24: 535. 1897.

Leaf-blades short and very broad, with a wide, often rectangular sinus; calyx-lobes narrower and longer, 6″–8″ long, the straight tip 2″–4″ long, sometimes extending back to the base of the ovary. Michigan, Illinois and Missouri.



[Vol. 2: p. 11.] 11a. Silene cónica L. Striate, or Corn Catchfly. (Fig. 1450a.)

Silene conica L. Sp. Pl. 418. 1753.

Annual, canescent or puberulent; stems solitary, or several together, erect, commonly forked above, 6′–24′ high. Leaves linear-lanceolate, acute, sessile, 1½′ long, or less, about 1½″ wide; inflorescence cymose; flowers 1–several; pedicels ¼′–1′ long; *calyx ovoid, rounded or truncate at the base, densely about 30 nerved*, its teeth triangular-subulate; *petals rose, obcordate*; capsule oblong-ovoid, distending the calyx and nearly equalling it.

Clyde Ohio. Adventive or naturalized from Europe. June July.

[Vol. 2: p. 60.] 3a. Delphinium Nélsoni Greene. Nelson's Larkspur. (Fig. 1564a.)

Delphinium Nelsoni Greene, Pittonia, 3: 92. 1896.

Finely puberulent, at least above; stem slender, simple, 8′–1½° high *from a cluster of tuberous roots* near the surface of the ground. Leaves firm, *the lower pedately divided into linear lobes* or segments, long-petioled, the petioles sheathing the stem, the upper short-petioled, less divided; flowers in the upper axils and forming a loose terminal raceme, blue, slightly villous, slender-pedicelled; lower pedicels 1′–2′ long, longer than the flowers; sepals oblong, shorter than the slender spur; *lower petal 2-cleft, with a tuft of hairs about the middle*; follicles 3, appressed-pubescent; seeds wing-angled above

Wyoming, western Nebraska and Colorado. May–June.

[Vol. 2: p. 117.] 10a. MYAGRUM L. Sp. Pl. 640. 1753.

An annual glabrous glaucous branching herb, with entire or undulate oblong to lanceolate leaves, the lower petioled, the upper sessile and deeply auricled at the base. Flowers small, yellow, in elongating racemes; pedicels short, erect-ascending, bractless. Sepals nearly erect. Petals short; longer stamens somewhat connate in pairs. Silicle obcuneate to spatulate, flattened, indehiscent, falsely 3-celled, 1-seeded, tipped by the short style. Seed pendulous; cotyledons incumbent. [Greek, a fly-trap.]

A monotypic genus of southern and central Europe and western Asia.

1. Myagrum perfoliàtum L. Myagrum. (Fig. 1699a.)

Myagrum perfoliatum L. Sp. Pl. 640. 1753.

Lower leaves oblong, narrowed into petioles; upper leaves 2′–5′ long, ½′–1′ wide, obtuse or acutish at the apex, the basal auricles mostly rounded; racemes, in fruit, elongating to several inches in length; pedicels 1″–2″ long, 2–3 times shorter than the pods, equalling or a little longer than the calyx; longer stamens about equalling the petals.

In waste places about Quebec. Fugitive or adventive from Europe. Summer.

[Vol. 2: p. 139.] 1a. Camelina microcàrpa Andrz. Small-fruited False-flax. (Fig. 1753a.)

Camelina microcarpa Andrz. DC. Syst. 2: 517. 1821.
Camelina sylvestris Wallr. Sched. Crit. 347. 1822.

Stem pubescent, at least below, simple or with few elongated branches. Leaves lanceolate, sessile, auricled, or the lower narrowed at the base; *fruiting racemes much elongated*, often 1° long or more; pedicels relatively somewhat shorter than those of *C. sativa*; *pod smaller, rather more flattened*, 2″–3″ long, strongly margined.

In waste places, Rhode Island to West Virginia, Idaho, British Columbia and Kansas. Naturalized or adventive from Europe. May-July.

[Vol. 2: p. 154.] 37a. CONRÍNGIA Link, Enum. 2: 172. 1822.

An erect glabrous annual herb, with elliptic or ovate entire leaves, sessile and cordate at the base, and middle-sized yellowish white flowers in terminal racemes. Sepals and petals narrow. Style 2-lobed or entire. Siliques elongated-linear, angled, the valves firm, 1–3-nerved. Seeds in 1 row in each cell, oblong, marginless; cotyledons incumbent. [In honor of Hermann Conring, 1606–1681, Professor at Helmstädt.]

1. Conringia orientàlis (L.) Dumort. Hare's-ear, Treacle Mustard. (Fig. 1790a.)

Brassica orientalis L. Sp. Pl. 666. 1753.
E. perfoliatum Crantz, Stirp. Aust. 1: 27. 1762.
Brassica perfoliata Lam. Encycl. 1: 748. 1783.
Erysimum orientale R. Br. Hort. Kew. Ed. 2. 4: 117. 1812.
Conringia perfoliata Link, Enum. 2: 172. 1822.
C. orientalis Dumort. Fl. Belg. 123. 1827.

Stem usually erect, simple, or somewhat branched, 1°–3° high. Leaves light green, obtuse at the apex, 2′–5′ long, ½′–2′ wide, the upper smaller; racemes at first short, much elongating in fruit; pedicels slender, ascending, 4″–8″ long; petals about ½′ long; nearly twice as long as the sepals; pods 3′–5′ long, about 1″ wide, 4-angled, spreading.

In waste places, Michigan and Minnesota to the Northwest Territory, and on the Atlantic Coast from New Brunswick to Pennsylvania. Recently become a bad weed in the Northwest.

[Vol. 2: p. 216.] 23a. Potentilla pùmila Poir. Dwarf Five-finger. (Fig. 1935a.)

P. pumila Poir. in Lam. Enc. Meth. 5: 594. 1804.
Potentilla Canadensis var. *pumila* T. & G. Fl. N. A. 1: 443. 1840.

Low perennial herb, seldom more than a few inches high; flowering stems at first very short and upright; later in the season producing *some slender prostrate runners*; *whole plant densely silky strigose*; basal leaves digitately 5-foliolate, on slender petioles; stem-leaves few and often only 3-foliolate; leaflets obovate, sharply serrate,

usually less than 1′ long; stipules small, lanceolate; flowers few, on slender 1-flowered axillary peduncles, *the first usually from the axil of the first stem-leaf*, yellow, 3″–5″ broad; petals broadly obovate, slightly exceeding the narrowly lanceolate, sub-equal sepals and bractlets; stamens about 20; style terminal, filiform.

In poor soil, New England to Pennsylvania. Closely related to *P. Canadensis*, but differing in its smaller size, denser and perfectly appressed pubescence, earlier blooming, and the lack of the long adsurgent stems characteristic of that species.

[Vol. 2: p. 218.] **1a. Waldsteinia parviflòra** Small. Southern Dry Strawberry. (Fig. 1939a.)

Waldsteinia parviflora Small, Bull. Torr. Club, 25: 137. 1898.

Perennial by horizontal rootstocks, villous-hirsute, or glabrous in age. Leaves basal, 5′–12′ high; petioles much longer than the blades, usually less densely pubescent than the scapes; leaflets cuneate-obovate or broadly rhomboidal, 1½′–3′ long, coarsely and irregularly crenate or lobed; scapes erect, solitary or several together, commonly shorter than the leaves, corymbose at top; calyx usually hairy, *the tube broadly turbinate*, 1¼″–1½″ *long*, the segments triangular-lanceolate, or lanceolate-acuminate, often shorter than the tube; *petals linear-oblong or narrowly elliptic, shorter than the calyx-segments or barely longer; achenes obovoid*, 1½″ long.

In woods and shaded soil, southwestern Virginia to North Carolina, Tennessee and Georgia. Ascends to 2100 feet in Virginia. March–May.

[Vol. 2: p. 256.] 3a. PROSÒPIS L. Mant. 1: 10. 1767.

Trees or shrubs often with spines in the axils, with 2-pinnate leaves, the pinnules few or numerous, and small spicate or capitate perfect flowers. Calyx campanulate, with 5 short teeth. Petals 5, valvate, distinct, or connate below. Stamens 10, distinct; filaments long. Ovary often stalked, many-ovuled; style slender or filiform; stigma very small. Pod linear, straight or curved, compressed, leathery, indehiscent, the mesocarp spongy or dry. Seeds flattened. [Ancient name for some very different plant.]

About 15 species, natives of warm and tropical regions. Besides the following, 2 or 3 others occur in the southwestern United States.

1. Prosopis glandulòsa Torr. Prairie Mesquite. (Fig. 2032a.)

Prosopis glandulosa Torr. Ann. Lyc. N. Y. 2: 192. *pl. 2.* 1828.

A glabrous or minutely pubescent shrub, the axils usually with a pair of sharp spines. Leaves petioled, with 2 spreading short-stalked pinnae, each of numerous sessile pinnules; pinnules linear or linear-oblong, entire, acute or obtuse, mostly mucronulate, firm, veiny, ½′–2′ long, 1″–2″ wide; spikes or spike-like racemes axillary, often numerous, peduncled, very densely many-flowered, 2′–5′ long, nearly ½′ thick; pedicels ½″–1″ long; calyx campanulate; petals 2–4 times as long as the calyx; ovary villous; pods linear, stipitate, 4′–8′ long, 4″–6″ wide, constricted between the seeds.

Kansas to Texas, Arizona and Mexico. Apparently distinct from the West Indian *P. juliflora*. April–June.

[Vol. 2: p. 288.] 4a. Parosela nàna (Torr.) Heller. Low Parosela. (Fig. 2107a.)

Dalea nana Torr.; A. Gray, Mem. Am. Acad. 4: 31. 1849.
Parosela nana Heller, Contr. Frankl. & Marsh. Coll. 1: 49. 1894.

Suffrutescent, erect, silky-villous throughout. Stems several from the same root, branched, 3′–10′ high; leaflets 3–5, rarely 4″–5″ long, obovate to linear-oblong, obtuse or mucronulate, narrowed at the base, rarely glabrate above, and usually minutely glandular beneath; petioles as long as the leaflets; spikes *oblong-ovoid, 5″–10″ long*, short-peduncled; bracts ovate, mucrouate or aristate, caducous; *corolla yellow, somewhat longer than the setaceous aristate and plumose calyx-teeth;* standard shorter than the wings and keel.

Sand hills and prairies, Comanche Co., Kansas to Texas and California.

[Vol. 2: p. 294.] 1a. Kraunhia macróstachys (T. & G.) Small. Long-clustered Wistaria. (Fig. 2120a.)

Wistaria frutescens var. *macrostachys* T. & G. Fl. N. A 1: 283. 1838.
Wistaria macrostachys Nutt.; T. & G. Fl. N. A. 1: 283. As synonym. 1838.
K. macrostachys Small, Bull. Torr. Club. 25: 134. 1898.

A vine, sometimes 20°–25° long. Stem becoming 1¼′ thick, branching; leaves 4′–8′ long; leaflets usually 9, *ovate to elliptic-lanceolate*, 1′–2¾′ long, acuminate, or acute, rounded or cordate at the base; racemes 8′–12′ long, loosely-flowered, drooping; rachis and pedicels densely hirsute and glandular; calyx pubescent like the pedicels, the tube campauulate, the segments lanceolate, *lateral ones about as long as the tube, lower one longer;* corolla lilac-purple or light blue; standard with blade 7″ broad, decurrent on the claw; pods 2′–4′ long, constricted between the black lustrous seeds.

In swamps, Tennessee to Missouri and Arkansas. Spring.

[Vol. 2: p. 312.] 1a. Stylosanthes ripària Kearney. Decumbent Pencil-flower. (Fig. 2168a.)

Stylosanthes riparia Kearney, Bull. Torr. Club, 24: 565. 1897.

Stems decumbent, or ascending, 3′–12′ long, usually with a tomentose line ou the elongated interuodes. Stipules sheathing, subulate above; petioles pubescent; *leaflets elliptic to obovate-cuneate*, the terminal one 5″–9″ long, the lateral ones somewhat smaller; spikes termiual, about 6-flowered, with only 1 or 2 perfect flowers; calyx-tube conspicuously veined, about 2″ long; vexillum proportionately longer than in *S. biflora; floral bracts (prophylla), usually deeply cleft to the middle, or beyond* (entire in *S. biflora*), 2-nerved; upper segment of the pod nearly twice as broad as in *S. biflora*.

In dry woods, Virginia and West Virginia to Alabama and Tennessee. May–Aug.

[Vol. 2: p. 361.] 1a. ANDRÁCHNE L. Sp. Pl. 1014. 1753.

Herbs, or shrubby plants, with diffusely brauching stems. Leaves alternate, petioled, the blades often membranous. Flowers mouoecious, axillary, pedicelled, the staminate often clustered, with a 5–6-lobed calyx, 5 or 6 petals, a glandular or lobed disk, 5 or 6 stamens and dis-

tinct filaments; pistillate flowers solitary, with a 5–6-lobed calyx, minute petals or these wanting; ovary 3-celled; styles stout, 2-cleft or 2-parted; ovules 2 in each cavity. Capsules dry, separating into 3 2-valved carpels. Seed somewhat curved, rugose; endosperm fleshy; embryo curved. [From the Greek for Portulaca.]

About 10 species, of wide geographic distribution.

1. **Andrachne phyllanthoides** (Nutt.) Müll. Arg. Northern Andrachne. (Fig. 2289a.)

Lepidanthus phyllanthoides Nutt. Trans. Am. Philos. Soc. 5: 175. 1837.
Andrachne phyllanthoides Müll. Arg. in DC. Prodr. 15: 435. As synonym. 1862.

A straggling much branched shrub, 1°–3° tall, with glabrous lustrous branches and minutely pubescent twigs. Leaves numerous, the blades obovate or oval, 4″–9″ long, retuse or obtuse at the apex, often mucronulate, bright green, paler beneath than above, short-petioled; pedicels filiform, 3″–10″ long, glabrous; calyx-segments oblong-obovate, ¾″–1½″ long, spreading; petals of two kinds, those of the staminate flowers narrowly obovate, or oblong-obovate, 3–5-toothed, greenish-yellow, those of the pistillate flowers smaller, broadly obovate, entire; capsule subglobose, rather fleshy until mature.

On rocky barrens, Missouri to Arkansas and Texas. Summer.

[Vol. 2: p. 363.] 3a. **Croton Lindheimeriànus** Scheele. Lindheimer's Croton. (Fig. 2292a.)

Croton Lindheimerianus Scheele, Linnaea, 25: 580. 1852.

Somewhat shrubby, whitish-tomentose. Stems erect, 4′–15′ tall, sometimes diffusely branched; leaves rather numerous, the blades ovate to oblong-ovate, ½′–2′ long, obtuse or acutish, green above, undulate; petioles almost ½ as long as the blades or shorter; pedicels 1″–3″ long, recurving; calyx slightly accrescent, its segments oblong or elliptic-oblong, becoming 2″ long, slightly keeled in age; petals pubescent; capsules oval, 3″–3½″ long, 3-celled, tomentose, truncate-obtuse at both ends, drooping; seeds oblong-elliptic, nearly 2″ long.

In dry soil, Kansas to Texas and New Mexico. Summer.

[Vol. 2: p. 373.] 8a. **Euphorbia hirsùta** (Torr.) Wiegand. Hairy Spurge. (Fig. 2314a.)

E. hypericifolia var. *hirsuta* Torr. Fl. N. & Mid. St. 331. 1826.
Euphorbia hirsuta Wiegand, Bot. Gaz. 24: 51. 1897.
Euphorbia Rafinesquii Greene, Pittonia, 3: 207. 1897.

Annual, *more or less hirsute*. Stems branched at the base, the branches prostrate or decumbent, 2′–10′ long, dichotomous, zigzag; leaves ovate-oblong, 4″–8″ long, acutish, serrulate nearly to the oblique base, pale beneath; petioles about ½″ long; stipules lacerate; peduncles surpassing the petioles; involucres funnelform, ½″ high, glabrous, *bearing 4 stalked saucer-shaped dark-brown glands, each subtended by white crenate appendages;* capsule about 1″ in diameter, broader than long, glabrous, retuse at the apex, its angles obtuse; seed slightly more than ½″ long, 4-angled, black with a white coating, its faces even or slightly wrinkled.

In sandy or gravelly soil, Quebec and Ontario to Connecticut, New York and Pennsylvania. June–Sept.

[Vol. 2: p. 391.] 4a. **Ilex lùcida** (Ait.) T. & G. Shining Inkberry. (Fig. 2359a.)

Prinos lucidus Ait. Hort. Kew, 1: 478. 1789.
Prinos coriaceus Pursh, Fl. Am. Sept. 221. 1814.
Ilex coriacea Chapm. Fl. S. States, 270. 1860.
Ilex lucida T. & G.; S. Wats. Bibl. Index, 1: 159. 1878.

A *glabrous* shrub, 15° high or less. Leaves thick, evergreen, *oval to obovate or oblong*, acute at both ends, entire, or with a few small sharp teeth, 1′–3′ long, dark green and shining above, paler and dotted beneath, short-petioled, somewhat viscid when young; flowers clustered in the axils, or the staminate solitary, the cymes sessile; pedicels bractless, short; calyx-segments 6-9; *drupe black, 3″–4″ in diameter;* nutlets flat, smooth.

Dismal Swamp, Virginia, to Florida and Louisiana. April–May.

[Vol. 2: p. 423.] 1a. **Sphaeralcea cuspidàta** (A. Gray.) Britton. Sharp-fruited Globe-Mallow. (Fig. 2431a.)

Sida stellata Torr. Ann. Lyc. N. Y. 2: 171. 1827. Not Cav. 1802.
Sphaeralcea stellata T. & G. Fl. N. A. 1: 228. 1838.
Sphaeralcea angustifolia var. *cuspidata* A. Gray, Proc. Am. Acad. 22: 293. 1887.

Perennial, *densely stellate-canescent;* stems rather stout, simple, or somewhat branched, leafy, 1°–4° high. *Leaves lanceolate, linear-lanceolate, or oblong-lanceolate*, obtuse, or acutish, firm, crenulate, the lower with petioles as long as the blade, the others short-petioled, the larger 2′–4′ long, ¼′–1′ wide, sometimes hastately lobed toward the base; *flowers red, 6″–10″ broad*, clustered in the axils, short-pedicelled; carpels 1–3-seeded, *cuspidate*, the tip often deciduous, *wrinkled on the sides*, stellate-canescent, or glabrate.

Kansas to Texas, Colorado, Arizona and Mexico. April–Aug.

[Vol. 2: p. 447.] 4a. **Viola doméstica** Bicknell. Yard Violet. (Fig. 2487a.)

Glabrous; fleshy, acaulescent, similar to *V. obliqua*. Rootstock short, or often elongated and stout; flowering scapes *usually obliquely ascending; petioles stout*, 1–3 times as long as the blades; blade broadly reniform, often only a little cordate or contracted at the base, cucullate in unfolding, irregularly crenate-dentate or crenulate nearly all around, mostly wrinkled and wavy, often 4′–5′ wide, somewhat decurrent on the petiole; petals dark blue, the lower and lateral ones bearded; peduncles of cleistogamous flowers *usually very numerous, horizontal*, mostly subterranean, *very stout*, often thickened toward the end, bearing pods about 4″ long.

Apparently always in cultivated soil, especially about buildings, southern New York, New Jersey and Pennsylvania. April–May.

[Vol. 2: p. 447.] 4b. **Viola cucullàta** Ait. Marsh Blue Violet. (Fig. 2487b.)

Viola cucullata Ait. Hort. Kew. 3: 228. 1789.

Glabrous or rarely sparingly pubescent, acaulescent; rootstock usually short. Leaves thin, *light green*, broadly ovate to reniform in outline, irregularly and not deeply crenate-dentate, usually cordate, cucullate in unfolding; blade mostly less than one-half as long as the petioles; flowering scapes elongated, usually equalling or exceeding the leaves; *petals light blue* (sometimes white); *peduncles of cleistogamous flowers slender, erect, often as long as the petioles, or longer.*

In marshes and wet woods. Common in the Eastern and Middle States. April-June.

[Vol. 2: p. 448.] 7a. **Viola emarginàta** (Nutt.) Le Conte. Triangle-leaved Violet. (Fig. 2490a.)

Viola sagittata var. *emarginata* Nutt. Gen. 1: 147. 1818.
Viola emarginata Le Conte, Ann. Lyc. N. Y. 2: 142. 1828.

Glabrous or very nearly so, often growing in large clumps, *succulent*, acaulescent. Rootstocks stout; petioles mostly much longer than the blades; *blades triangular, or ovate-triangular in outline*, from merely dentate to deeply cleft, then simulating forms of *V. palmata;* flowering scapes about as long as the leaves; flowers blue, the petals often emarginate; *pods of cleistogamous flowers on slender erect peduncles.*

In fields and on hillsides, southern New York to Virginia. April–May.

[Vol. 3: p. 12.] 21a. **Asclepias galioìdes** H.B.K. Bedstraw Milkweed. (Fig. 2920a.)

Asclepias galioides H.B.K. Nov. Gen. 3: 188. 1818.

Glabrous, except the minutely pubescent stems and pedicels. Stems erect, 1° high or more, from a horizontal rootstock; leaves erect or spreading, in whorls of 2–6, *narrowly linear, 2′–3′ long, the margins revolute;* peduncles longer than the pedicels and shorter than the leaves; umbels 9″–13″ in diameter; flowers greenish-white; corolla-segments 2″ long; hoods as high as the anthers, broadly rounded at the summit, dorsally hastate-sagittate, the ventral margins slightly involute, entire; *horn arising from the base of the hood, long-exserted over the anthers;* anther-wings minutely notched at the base; follicles erect on erect fruiting pedicels, attenuated, 2′–2¾′ long, glabrous or minutely puberulent.

Kansas to Colorado, Arizona and Mexico. May-July.

[Vol. 3: p. 98.] **1a. Stachys Germánica** L. Downy Woundwort. Mouse-ear. (Fig. 3122a.)

Stachys Germanica L. Sp. Pl. 581. 1753.

Annual; stem erect, simple, or somewhat branched, 1°–3° high, *densely villous. Leaves oval, ovate or lanceolate, crenate-dentate, villous, the lower rounded or subcordate at the base*, long-petioled, mostly obtuse at the apex, the upper short petioled or sessile, narrowed at both ends; clusters of flowers dense, borne in most of the axils; bracts lanceolate, half as long as the calyx; calyx-teeth ovate, acuminate, awned; corolla purple, its tube about as long as the calyx.

Roadsides near Guelph, Ontario. Adventive from Europe. July-Sept.

[Vol. 3: p. 411.] **7a. Parthenium auriculàtum** Britton. Auricled Parthenium. (Fig. 3875a.)

Rootstock *an oval erect tuber* twice as long as thick; *stem villous-pubescent*, 1½°–2½° high. Leaves rough above, villous, especially on the veins beneath, oval, ovate or oblong, irregularly crenate-dentate, some or all of them laciniate or pinnatifid at the base, the basal and lower slender-petioled with petiole as long as the blade, or longer, *the upper with a sessile clasping auricled base*, or with margined clasping petioles; inflorescence densely corymbose, its branches villous-tomentose; bracts of the involucre densely canescent.

Near Clarksville, Va. (W. W. Ashe, No. 2400), Alleghany Mountains (H. H. Eaton, 1831).

SUMMARY.

	Families.	Genera.	Species.
PTERIDOPHYTA	11	30	115
SPERMATOPHYTA			
Gymnospermae	2	10	27
Angiospermae			
Monocotyledones	28	217	1058
Dicotyledones			
Choripetalae	92	468	1601
Gamopetalae	44	378	1361
TOTAL	177	1103	4162
FIGURES			1–4081
" Appendix			81
TOTAL			4162

Glossary of Special Terms.

Acaulescent. With stem subterranean, or nearly so.
Accumbent. Cotyledons with margins folded against the hypocotyl.
Achene. A dry one-seeded indehiscent fruit with the pericarp tightly fitting around the seed.
Acicular. Needle-shaped.
Acuminate. Gradually tapering to the apex.
Acute. Sharp pointed.
Adnate. An organ adhering to a contiguous differing one; an anther attached longitudinally to the end of the filament.
Adventive. Not indigenous, but apparently becoming naturalized.
Albumen. See *Endosperm.*
Alliaceous. Onion-like, in aspect or odor.
Alternate. Not opposite; with a single leaf at each node.
Alveolate. Like honeycomb; closely pitted.
Ament. A spike of imperfect flowers subtended by scarious bracts, as in the willows.
Amphibious. At times inhabiting the water.
Amphitropous. Term applied to the partly inverted ovule.
Amplexicaul. Clasping the stem, or other axis.
Anastomosing. Connecting so as to form a well-defined network.
Anatropous. Applied to an inverted ovule with the micropyle very near the hilum.
Androgynous. Flower clusters having staminate and pistillate flowers.
Angiospermous. Pertaining to the Angiospermae; bearing seeds within a pericarp.
Anther. The part of the stamen which contains the pollen.
Antherid. The male organ of reproduction in Pteridophyta and Bryophyta.
Anthesis. Period of flowering.
Apetalous. Without a corolla.
Apical. At the top, or referring to the top.
Apiculate. With a minute pointed tip.
Appressed. Lying against another organ.
Arborescent. Tree-like, in size or shape.
Archegone. The female reproductive organ in Pteridophyta and Bryophyta.
Areolate. Reticulated.
Areolation. The system of meshes in a network of veins.
Areole. A mesh in a network of veins.
Aril. A fleshy organ growing about the hilum.
Arillate. Provided with an aril.
Aristate. Tipped by an awn or bristle.
Aristulate. Diminutive of aristate.
Ascending. Growing obliquely upward, or upcurved.
Asexual. Without sex.
Assurgent. See *Ascending.*
Auricled. (*Auriculate*) with basal ear-like lobes.
Awn. A slender bristle-like organ.
Axil. The point on a stem immediately above the base of a leaf.
Axile. In the axis of an organ.
Axillary. Borne at, or pertaining to an axil.
Baccate. Berry-like.
Barbellate. Furnished with minute barbs.
Basifixed. Attached by the base.
Berry. A fruit with pericarp wholly pulpy.
Bilabiate. With two lips.
Bipinnate. Twice pinnate.
Bipinnatifid. Twice pinnatifid.
Blade. The flat expanded part of a leaf.
Bract. A leaf, usually small, subtending a flower or flower-cluster, or a sporange.
Bracleate. With bracts.
Bracleolate. Having bractlets.
Bractlet. A secondary bract, borne on a pedicel, or immediately beneath a flower; sometimes applied to minute bracts.
Bulb. A bud with fleshy scales, usually subterranean.
Bulblet. A small bulb, especially those borne on leaves, or in their axils.
Bulbous. Similar to a bulb; bearing bulbs.
Caducous. Falling away very soon after development.
Caespitose. Growing in tufts.
Callosity. A small, hard protuberance.
Callus. An extension of the inner scale of a grass spikelet; a protuberence.
Calyx. The outer of two series of floral leaves.
Campanulate. Bell-shaped.
Campylotropous. Term applied to the curved ovule.
Cancellate. Reticulated, with the meshes sunken.
Canescent. With gray or hoary fine pubescence.
Canaliculate. Channelled; longitudinally grooved.
Capitate. Arranged in a head; knob-like.
Capsular. Pertaining to or like a capsule.
Capsule. A dry fruit of two carpels or more, usually dehiscent by valves or teeth.
Carinate. Keeled: with a longitudinal ridge.
Carpel. The modified leaf forming the ovary, or a part of a compound ovary.
Caruncle. An appendage to a seed at the hilum.
Carunculate. With a caruncle.
Caryopsis. The grain; fruit of grasses, with a thin pericarp adherent to the seed.
Caudate. With a slender tail-like appendage.
Caudex. The persistent base of perennial herbs, usually only the part above ground.
Caudicle. Stalk of a pollen-mass in the Orchid and Milkweed Families.
Cauline. Pertaining to the stem.
Cell. A cavity, of an anther or ovary.
Chaff. Thin dry scales.
Chalaza. The base of the ovule.
Chartaceous. Papery in texture.
Chlorophyll. Green coloring matter of plants.
Chlorophyllous. Containing chlorophyll.
Ciliate. Provided with marginal hairs.
Ciliolate. Minutely ciliate.
Cilium. A hair.
Cinereous. Ashy; ash-colored.
Circinnate. Coiled downward from the apex.
Circumscissile. Transversely dehiscent, the top falling away as a lid.
Clavate. Club-shaped.
Cleistogamous. Flowers which do not open, but are pollinated from their own authers.
Cleft. Cut about halfway to the midvein.
Clinandrium. Cavity between the anther-sacs in orchids.
Cochleate. Like a snail shell.
Coma. Tuft of hairs at the ends of some seeds.
Commissure. The contiguous surfaces of two carpels.
Conduplicate. Folded lengthwise.
Confluent. Blended together.
Connate. Similar organs more or less united.
Connective. The end of the filament, between the anther-sacs.
Connivent. Converging.
Convolute. Rolled around or rolled up longitudinally.
Coralloid. Resembling coral.
Cordate. Heart-shaped.
Coriaceous. Leathery in texture.
Corm. A swollen fleshy base of a stem.
Corolla. The inner of two series of floral leaves.
Corona; Crown. An appendage of the corolla; a crown-like margin at the top of an organ.
Coroniform. Crown-like.
Corymb. A convex or flat-topped flower-cluster of the racemose type with pedicels or rays arising from different points on the axis.

Corymbose. Borne in corymbs; corymb-like.
Costate. Ribbed.
Cotyledon. A rudimentary leaf of the embryo.
Crenate. Scalloped; with rounded teeth.
Crenulate. Diminutive of crenate.
Crustaceous. Hard and brittle.
Cucullate. Hooded, or resembling a hood.
Culm. The stem of grasses and sedges.
Cuneate. Wedge-shaped.
Cusp. A sharp stiff point.
Cuspidate. Sharp-pointed; ending in a cusp.
Cyme. A convex or flat flower-cluster of the determinate type, the central flowers first unfolding.
Cymose. Arranged in cymes; cyme-like.
Deciduous. Falling away at the close of the growing period.
Decompound. More than once-divided.
Decumbent. Stems or branches in an inclined position, but the end ascending.
Decurrent. Applied to the prolongation of an organ, or part of an organ running along the sides of another.
Deflexed. Turned abruptly downward.
Dehiscence. The opening of an ovary, anther-sac or sporange to emit the contents.
Dehiscent. Opening to emit the contents.
Deltoid. Broadly triangular, like the Greek letter delta, Δ.
Dentate. Toothed, especially with outwardly projecting teeth.
Denticulate. Diminutive of dentate.
Depauperate. Impoverished, small.
Depressed. Vertically flattened.
Dextrorse. Spirally ascending to the right.
Diadelphous. Stamens united into two sets.
Diandrous. Having two stamens.
Dichotomous. Forking regularly into two nearly equal branches or segments.
Dicotyledonous. With two cotyledons.
Didymous. Twin-like; of two nearly equal segments.
Diffuse. Loosely spreading.
Digitate. Diverging, like the fingers spread.
Dimorphous. Of two forms.
Dioecious. Bearing staminate flowers or antherids on one plant, and pistillate flowers or archegones on another of the same species.
Discoid. Heads of Compositae composed only of tubular flowers; rayless; like a disk.
Disk. An enlargement or prolongation of the receptacle of a flower around the base of the pistil; the head of tubular flowers in Compositae.
Dissected. Divided into many segments or lobes.
Dissepiment. A partition-wall of an ovary or fruit.
Distichous. Arranged in two rows.
Distinct. Separate from each other; evident.
Divaricate. Diverging at a wide angle.
Divided. Cleft to the base or to the mid-nerve.
Dorsal. On the back, or pertaining to the back.
Drupaceous. Drupe-like.
Drupe. A simple fruit, usually indehiscent with fleshy exocarp and bony endocarp.
Drupelet. Diminutive of drupe.
Echinate. Prickly.
Ellipsoid. A solid body, elliptic in section.
Elliptic. With the outline of an ellipse; oval.
Emarginate. Notched at the apex.
Embryo. A rudimentary plant in the seed.
Embryo-sac. The macrospore of the flowering plants, contained in the ovule.
Endocarp. The inner layer of the pericarp.
Endogenous. Forming new tissue within.
Endosperm. The substance surrounding the embryo of a seed; albumen.
Ensiform. Shaped like a broad sword.
Entire. Without divisions, lobes, or teeth.
Ephemeral. Continuing for only a day or less.
Epigynous. Adnate to or borne on the upper part of the ovary.
Epiphytic. Growing on other plants, but not parasitic.
Equitant. Folded around each other; straddling.
Erose. Irregularly margined, as if gnawed.
Evanescent. Early disappearing.
Evergreen. Bearing green leaves throughout the year.
Excurrent. With a tip projecting beyond the main part of the organ.
Exfoliating. Peeling off in layers.
Exocarp. The outer layer of the pericarp.
Exogenous. Forming new tissue outside the older.
Exserted. Prolonged past surrounding organs.
Exstipulate. Without stipules.
Extrorse. Facing outward.
Falcate. Scythe-shaped.
Farinaceous. Starchy, or containing starch.
Fascicle. A dense cluster.
Fascicled. Borne in dense clusters.
Fastigiate. Stems or branches which are nearly erect and close together.
Fenestrate. With window-like markings.
Fertile. Bearing spores, or bearing seed.
Fertilization. The mingling of the contents of a male and female cell.
Ferruginous. Color of iron-rust.
Fetid. Ill-smelling.
Fibrillose. With fibres or fibre-like organs.
Filament. The stalk of an anther; the two forming the stamen.
Filamentous. Composed of thread-like structures; thread-like.
Filiform. Thread-like.
Fimbriate. With fringed edges.
Fimbrillate. Minutely fringed.
Fistular. Hollow and cylindric.
Flabellate. Fan-shaped, or arranged like the sticks of a fan.
Flaccid. Lax; weak.
Flexuous. Alternately bent in different directions.
Floccose. With loose tufts of wool-like hairs.
Foliaceous. Similar to leaves.
Foliolate. With separate leaflets.
Follicle. A simple fruit dehiscent along one suture.
Follicular. Similar to a follicle.
Foveate. Foveolate. More or less pitted.
Free. Separate from other organs; not adnate.
Frond. The leaves of ferns.
Frutescent. Fruticose. More or less shrub-like.
Fugacious. Falling soon after development.
Fugitive. Plants not native, but occurring here and there, without direct evidence of becoming established.
Funiculus. The stalk of an ovule or seed.
Fusiform. Spindle-shaped.
Galea. A hood-like part of a perianth or corolla.
Galeate. With a galea.
Gametophyte. The sexual generation of plants.
Gamopetalous. With petals more or less united.
Gemma. A bud-like propagative organ.
Gibbous. Enlarged or swollen on one side.
Glabrate. Nearly without hairs.
Glabrous. Devoid of hairs.
Gladiate. Like a sword-blade.
Gland. A secreting cell, or group of cells.
Glandular. With glands, or gland-like.
Glaucous. Covered with a fine bluish or white bloom; bluish-hoary.
Globose. Spherical or nearly so.
Glomerate. In a compact cluster.
Glomerule. A dense capitate cyme.
Glumaceous. Resembling glumes.
Glume. The scaly bracts of the spikelets of grasses and sedges.
Granulose. Composed of grains.
Gregarious. Growing in groups or colonies.
Gynobase. A prolongation or enlargement of the receptacle, supporting the ovary.
Habil. General aspect.
Habital. A plant's natural place of growth.
Hastate. Halberd-shaped; like sagittate, but with the basal lobes diverging.
Haustoria. The specialized roots of parasites.
Head. A dense round cluster of sessile or nearly sessile flowers.

Herbaceous. Leaf-like in texture and color; pertaining to an herb.
Hilum. The scar or area of attachment of a seed or ovule.
Hirsute. With rather coarse stiff hairs.
Hispid. With bristly stiff hairs.
Hispidulous. Diminutive of hispid.
Hyaline. Thin and translucent.
Hypocotyl. The rudimentary stem of the embryo; also termed *radicle.*
Hypogynium. Organ supporting the ovary in some sedges.
Hypogynous. Borne at the base of the ovary, or below.
Imbricated. Overlapping.
Imperfect. Flowers with either stamens or pistils, not with both.
Incised. Cut into sharp lobes.
Included. Not projecting beyond surrounding parts.
Incumbent. With the back against the hypocotyl.
Indehiscent. Not opening.
Indusium The membrane covering a sorus.
Inequilateral. Unequal sided.
Inferior. Relating to an organ which arises or is situated below another.
Inflexed. Abruptly bent inward.
Inflorescence. The flowering part of plants; its mode of arrangement.
Integument. A coat or protecting layer.
Internode. Portion of a stem or branch between two successive nodes.
Introrse. Facing inward.
Involucel. A secondary involucre.
Involucrate. With an involucre, or like one.
Involucre. A whorl of bracts subtending a flower or flower-cluster.
Involute. Rolled inwardly.
Irregular. A flower in which one or more of the organs of the same series are unlike.
Labiate. Provided with a lip-like organ; belonging to the family Labiatae.
Laciniate. Cut into narrow lobes or segments.
Lanceolate. Considerably longer than broad, tapering upward from the middle or below; lance-shaped.
Latex. The milky sap of certain plants.
Leaflet. One of the divisions of a compound leaf.
Legume. A simple dry fruit dehiscent along both sutures.
Lenticular. Lens-shaped.
Ligulate. Provided with or resembling a ligule.
Ligule. A strap-shaped organ, as the rays in Compositae.
Limb. The expanded part of a petal, sepal, or gamopetalous corolla.
Linear. Elongated and narrow with sides nearly parallel.
Lineolate. With fine or obscure lines.
Lobed. Divided to about the middle.
Loment. A jointed legume, usually constricted between the seeds.
Loculicidal. Applied to capsules which split longitudinally.
Lodicules. Minute hyaline scales subtending the flower in grasses.
Lunate. Crescent-shaped,
Lyrate. Pinnatifid, with the terminal lobe or segment considerably larger than the others.
Macrosporange. Sporange containing macrospores.
Macrospore. The larger of two kinds of spores borne by a plant, usually giving rise to a female prothallium.
Marcescent. Withering but remaining attached.
Medullary. Pertaining to the pith or medulla.
Mericarp. One of the carpels of the Umbelliferae.
Mesocarp. The middle layer of a pericarp.
Micropyle. Orifice of the ovule, and corresponding point on the seed.
Microsporange. Sporange containing microspores.
Microspore. The smaller of two kinds of spore borne by a plant, usually giving rise to a male prothallium; pollen-grain.
Midvein (Midrib). The central vein or rib of a leaf or other organ.
Monadelphous. Stamens united by their filaments.
Moniliform. Like a string of beads.
Monoecious. Bearing stamens and pistils on the same plant, but in different flowers.
Monstrous. Unusual or deformed.
Mucronate. With a short sharp abrupt tip.
Mucronulate. Diminutive of mucronate.
Muricate. Roughened with short hard processes.
Muticous. Pointless, or blunt.
Naked. Lacking organs or parts which are normally present in related species or genera.
Naturalized. Plants not indigenous to the region, but so firmly established as to have become part of the flora.
Nectary. A sugar-secreting organ.
Node. The junction of two internodes of a stem or branch, often hard or swollen, at which a leaf or leaves are usually borne.
Nodose. Similar to nodes or joints; knotty.
Nodulose. Diminutive of nodose.
Nut. An indehiscent one-seeded fruit with a hard or bony pericarp.
Nutlet. Diminutive of nut.
Obcordate. Inversely heart-shaped.
Oblanceolate. Inverse of lanceolate.
Oblong. Longer than broad with the sides nearly parallel, or somewhat curving.
Obovate. Inversely ovate.
Obovoid. Inversely ovoid.
Obsolete. Not evident; gone, rudimentary, or vestigial.
Obtuse. Blunt, or rounded.
Ochreae. The sheathing united stipules of Polygonaceae.
Ochreolae. The ochreae subtending flowers in the Polygonaceae.
Ochroleucous. Yellowish white.
Oösphere. The cell of the archegone which is fertilized by spermatozoids.
Operculate. With an operculum.
Opercutum. A lid.
Orbicular. Approximately circular in outline.
Orthotropous. Term applied to the straight ovule, having the hilum at one end and the micropyle at the other.
Ovary. The ovule-bearing part of the pistil.
Ovate. In outline like a longitudinal section of a hen's egg.
Ovoid. Shaped like a hen's egg.
Ovule. The macrosporange of flowering plants, becoming the seed on maturing.
Palate. The projection from the lower lip of two-lipped personate corollas.
Palet. A bract-like organ enclosing or subtending the flower in grasses.
Palmate. Diverging radiately like the fingers.
Panicle. A compound flower cluster of the racemose type, or cluster of sporanges.
Paniculate. Borne in panicles or resembling a panicle.
Papilionaceous. Term applied to the irregular flower of the Pea Family.
Papillose. With minute blunt projections.
Pappus. The bristles, awns, teeth, etc., surmounting the achene in the Chicory and Thistle Families.
Parasitic. Growing upon other plants and absorbing their juices.
Parietal. Borne along the wall of the ovary, or pertaining to it.
Parted. Deeply cleft.
Pectinate. Comb-like.
Pedicel. The stalk of a flower in a flower-cluster, or of a sporange.
Peduncle. Stalk of a flower, or a flower-cluster, or a sporocarp.
Pedunculate. With a peduncle.
Peltate. Shield-shaped; a flat organ with a stalk on its lower surface.

Penicillate. With a tuft of hairs or hair-like branches.
Perfect. Flowers with both stamens and pistils.
Perfoliate. Leaves so clasping the stem as to appear as if pierced by it.
Perianth. The modified floral leaves (sepals or petals), regarded collectively.
Pericarp. The wall of the fruit, or seed-vessel.
Perigynium. The utricle enclosing the ovary or achene in the genus *Carex*.
Perigynous. Borne on the perianth, around the ovary.
Peripheral. Pertaining to the periphery.
Persistent. Organs remaining attached to those bearing them after the growing period.
Petal. One of the leaves of the corolla.
Petaloid. Similar to petals; petal-like.
Petiolate. With a petiole.
Petiole. The stalk of the leaf.
Phyllode. A bladeless petiole or rachis.
Pilose. With long soft hairs.
Pinna. A primary division of a pinnately compound leaf.
Pinnate. Leaves divided into leaflets or segments along a common axis.
Pinnatifid. Pinnately cleft to the middle or beyond.
Pinnule. A division of a pinna.
Pistil. The central organ of a flower containing the macrosporanges (ovules).
Pistillate. With pistils; and usually employed in the sense of without stamens.
Placenta. An ovule-bearing surface.
Plicate. Folded into plaits, like a fan.
Plumose. Resembling a plume or feather.
Plumule. The rudimentary terminal bud of the embryo.
Pollen. Pollen-grain. See Microspore.
Pollinia. The pollen-masses of the Orchid and Milkweed Familes.
Polygamous. Bearing both perfect and imperfect flowers.
Polypetalous. With separate petals.
Pome. The fleshy fruit of the Apple Family
Procumbent. Trailing or lying on the ground.
Prophylla. Bractlets.
Prothallium. The sexual generation of Pteridophyta.
Puberulent. With very short hairs.
Pubescent. With hairs.
Punctate. With translucent dots or pits.
Pungent. With a sharp stiff tip.
Pyriform. Pear-shaped.
Raceme. An elongated determinate flower-cluster with each flower pedicelled.
Racemose. In racemes, or resembling a raceme.
Rachilla. The axis of the spikelet in grasses.
Rachis. The axis of a compound leaf, or of a spike or raceme.
Radiant. With the marginal flowers enlarged and ray-like.
Radiate. With ray-flowers; radiating.
Radicle. The rudimentary stem of the embryo; hypocotyl.
Radicular. Pertaining to the radicle or hypocotyl.
Raphe (*Rhaphe*). The ridge connecting the hilum and chalaza of an anatropous or amphitropous ovule; the ridge on the sporocarp of *Marsilea*.
Ray. One of the peduncles or branches of an umbel; the flat marginal flowers in Compositae.
Receptacle. The end of the flower stalk, bearing the floral organs, or, in Compositae, the flowers; also, in some ferns, an axis bearing sporanges.
Recurved. Curved backward.
Reflexed. Bent backward abruptly.
Regular. Having the members of each part alike in size and shape.
Reniform. Kidney-shaped.
Repand. With a somewhat wavy margin.
Reticulate. Arranged as a network.
Retrorse. Turned backward or downward.
Retuse. With a shallow notch at the end.
Revolute. Rolled backward.
Rhachis. See *Rachis*.
Rhizome. See *Rootstock*.
Rootstock. A subterranean stem, or part of one.
Ringent. The gaping mouth of a two-lipped corolla.
Rostellum. Beak of the style in Orchids.
Rostrate. With a beak.
Rosulate. Like a rosette.
Rotate. With a flat round corolla-limb.
Rugose. Wrinkled.
Runcinate. Sharply pinnatifid, or incised, the lobes or segments turned backward.
Sac. A pouch, especially the cavities of anthers.
Saccate. With a pouch or sac.
Sagittate. Like an arrow-head, with the lobes turned downward.
Samara. A simple indehiscent winged fruit.
Saprophyte. A plant which grows on dead organic matter.
Scabrous. Rough.
Scale. A minute, rudimentary or vestigial leaf.
Scape. A leafless or nearly leafless stem or peduncle, arising from a subterranean part of a plant, bearing a flower or flower-cluster.
Scapose. Having scapes, or resembling a scape.
Scarious. Thin, dry, and translucent, not green.
Scorpioid. Coiled up in the bud, unrolling in growth.
Secund. Borne along one side of an axis.
Segment. A division of a leaf or fruit.
Sepal. One of the leaves of a calyx.
Septate. Provided with partitions.
Septicidal. A capsule which splits longitudinally into and through its dissepiments.
Serrate. With teeth projecting forward.
Serrulate. Diminutive of serrate; serrate with small teeth.
Sessile. Without a stalk.
Setaceous. Bristle-like.
Setose. Bristly.
Silicle. A silique much longer than wide.
Silique. An elongated two-valved capsular fruit, with two parietal placentae, usually dehiscent.
Sinuate. With strongly wavy margins.
Sinuous. In form like the path of a snake.
Sinus. The space between the lobes of a leaf.
Sorus (*Sori*). A group or cluster of sporanges.
Spadiceous. Like or pertaining to a spadix.
Spadix. A fleshy spike of flowers.
Spathaceous. Resembling a spathe.
Spathe. A bract, usually more or less concave, subtending a spadix.
Spatulate. Shaped like a spatula; spoon-shaped.
Spermatozoids. Cells developed in the antherid, for the fertilization of the oösphere.
Spicate. Arranged in a spike; like a spike.
Spike. An elongated flower cluster or cluster of sporanges, with sessile or nearly sessile flowers or sporanges.
Spikelet. Diminutive of spike; especially applied to flower-clusters of grasses and sedges.
Spinose. With spines or similar to spines.
Spinule. A small sharp projection
Spinulose. With small sharp processes or spines.
Sporange. A sac containing spores.
Spore. An asexual vegetative cell.
Sporocarp. Organ containing sporanges or sori.
Sporophyte. The asexual generation of plants.
Spreading. Diverging nearly at right angles; nearly prostrate.
Spur. A hollow projection from a floral organ.
Squarrose With spreading or projecting parts.
Stamen The organ of a flower which bears the microspores (pollen-grains).
Staminodium. A sterile stamen, or other organ in the position of a stamen.
Standard. The upper, usually broad, petal of a papilionaceous corolla.
Stellate. Star-like.
Sterigmata. The projections from twigs, bearing the leaves in some genera of Pinaceae.
Sterile. Without spores, or without seed.
Stigma. The summit or side of the pistil to which pollen-grains become attached.

Stipe. The stalk of an organ.
Stipitate. Provided with a stipe.
Stipules. Appendages to the base of a petiole, often adnate to it.
Stipulate. With stipules.
Stolon. A basal branch rooting at the nodes.
Stoloniferous. Producing or bearing stolons.
Stoma (*Stomata*). The transpiring orifices in the epidermis of plants.
Strict. Straight and erect.
Strigose. With appressed or ascending stiff hairs.
Strophiole. An appendage to a seed at the hilum.
Strophiolate. With a strophiole.
Style. The narrowed top of the ovary.
Stylopodium. The expanded base of a style.
Subacute. Somewhat acute.
Subcordate. Somewhat heart-shaped.
Subcoriaceous. Approaching leathery in texture.
Subfalcate. Somewhat scythe-shaped.
Subligneous. Somewhat woody in texture.
Subterete. Nearly terete.
Subulate. Awl-shaped.
Subversatile. Partly or imperfectly versatile.
Succulent. Soft and juicy.
Sulcate. Grooved longitudinally.
Superior. Applied to the ovary when free from the calyx; or to a calyx adnate to an ovary.
Suture. A line of splitting or opening.
Symmetrical. Applied to a flower with its parts of equal numbers.
Syncarp. A fleshy multiple or aggregate fruit.
Tendril. A slender coiling organ.
Terete. Circular in cross section.
Ternate. Divided into three segments, or arranged in threes.
Tetradynamous. With four long stamens and two shorter ones.
Thallus. A usually flat vegetative organ.
Thyrsoid. Like a thyrsus.
Thyrsus. A compact panicle.
Tomentose. Covered with tomentum.
Tomentulose. Diminutive of tomentose.
Tomentum. Dense matted wool-like hairs.
Torsion. Twisting of an organ.
Tortuous. Twisted or bent.
Tracheae. The canals or ducts in woody tissue.
Tracheids. Wood-cells.
Triandrous. With three stamens.
Tricarpous. Composed of three carpels.
Trimorphous. Flowers with stamens of three different lengths or kinds; in three forms.
Triquetrous. Three-sided, the sides channeled.
Truncate. Terminated by a nearly straight edge or surface.
Tuber. A thick short underground branch or part of a branch.
Tubercle. The persistent base of the style in some Cyperaceae; a small tuber.
Tuberculate. With rounded projections.
Turbinate. Top-shaped.
Uliginous. Inhabiting mud.
Umbel. A determinate, usually convex flower-cluster, with all the pedicels arising from the same point.
Umbellate. Borne in umbels; resembling an umbel.
Umbellet. A secondary umbel.
Umbelloid. Similar to an umbel.
Uncinate. Hooked, or in form like a hook.
Undulate. With wavy margins.
Urceolate. Urn-shaped.
Utricle. A bladder-like organ; a one-seeded fruit with a loose pericarp.
Valvate. Meeting by the margins in the bud, not overlapping; dehiscent by valves.
Vascular. Relating to ducts or vessels.
Vein. One of the branches of the woody portion of leaves or other organs.
Veinlet. A branch of a vein.
Velum. A fold of the inner side of the leaf-base in *Isoetes*.
Velutinous. Velvety; with dense fine pubescence.
Venation. The arrangement of veins.
Vernation. The arrangement of leaves in the bud.
Versatile. An anther attached at or near its middle to the filament.
Verticillate. With three or more leaves or branches at a node; whorled.
Vestigial. In the nature of a vestige or remnant.
Villous. With long soft hairs, not matted together.
Virgate. Wand-like.
Whorl. A group of three similar organs or more, radiating from a node. Verticil.
Whorled. See Verticillate.
Winged. With a thin expansion or expansions.

ERRATA.

VOL. I, Fig. 63 For "one-forked" read "once-forked."
Fig. 114. First line, read Pinus divaricata (Ait.) Gordon. The citation is *Pinus divaricata* Gordon, Pinetum: 163. 1858.
p. 86. Generic description of *Lophotocarpus*, after "Perennial" add "or annual."
p. 93. Line 4. Read "elongated."
Fig. 467. Add *Poa pseudopratensis* Scribn. & Rydb. Contr. Nat. Herb. 3: 531. *pl. 20.* 1896.
p. 209. Under *Scolochloa*, for "rickle-like," read "prickle-like."
Fig. 496. Read Puccinellia angustata (R. Br.) Redf. & Rand, Fl. Mt. Desert, 181. 1894.
Fig. 918. For "1"-1½" long," read "1'-1½'."
p. 410. Under Liliaceae, for *Agave* read *Yucca* in two places.
p. 416. Under *Lilium*; for "diciduous," read "deciduous."
p. 456. Key, for *Periamium* read *Peramium*.
p. 476. Citation of *Leptorchis*, read "Philom."
Fig. 1174. For *Wardii* read *Wardi*.

VOL. II, Fig. 1595. Read *terrestris*.
Fig. 1630. For "recurved" read "inflexed."
p. 118, Key, for *Sinapistrum* read *arvensis*.
p. 127, Key, for *Douglasii* read *purpurea*.
Fig. 2065, after Blackseed insert period.
Fig. 2249. Read "Pink Needle."
Fig. 2250. Read "2'-6' high."
p. 370, Key. For *strictospora* read *slictospora*.
Figs. 2314, 2315. For "ash-colored," read "brown."
Fig. 2425. Read *Malvastrum*.
Fig. 2530. For "according to Hitchcock," read "according to B. B. Smyth."
Fig. 2669. For *Anethrum* read *Anethum*.
Fig. 2698. For "Britton," read "Heller," and add citation *Spermolepis echinatus* Heller, Contr. F. & M. Coll. 1: 73. 1895.
Fig. 2776. Read "Burren Myrtle."

VOL. III, p. 18, First line, for *laevis* read *laeve*.
Fig. 3174. Note, read "Sage of Bethlehem."
Fig. 3229. For "or" read "Adam's-flannel."
p. 144. For Fig 2333 read 3233.
Fig. 3412. For "Clover" read "Claver-" grass.
Fig. 3434. Read "Wayfaring."
p. 300, Key, No. 38, for *Ianactis* read *Ionactis*.
Fig. 3708. Note, Var. 4, Read *gilvocanescens*.
p. 396, Key, for *viscosa* read *foetida*.

A few errors in accent and in index paging are corrected in the General Index.

General Index of Latin Names.

[Classes and Families in SMALL CAPITALS; genera in **heavy face**; synonyms in *italics*. **Heavy face** figures indicate the volume; other figures, the page.]

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